

Running Head: ATHLETE MOTIVATION, COPING AND AFFECT

The Relationship between athlete motivation, strategies used to cope with stress and  
affective outcomes in Canadian University athletes.

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### **Abstract**

Motivation to perform and coping with stress during performance are key factors in determining numerous outcomes of sporting performance. However, less evidence is in place assessing their relationship. The aim of this investigation was to assess the relationship between athlete motivation and the coping strategies used to deal with stress during their sporting performance, as well as the relationship between motivation and affect and coping and affect. One hundred and forty five university athletes completed questionnaires. Regressions revealed that two of the three self determined levels of motivation, identified and integrated regulation, predicted increased task-oriented coping strategies. Two of the three non-self determined levels of motivation, amotivation and external regulation, significantly predicted disengagement-oriented coping. Additionally, intrinsic motivation and task-oriented coping predicted increase positive affect. Increased disengagement-oriented coping predicted decreased positive affect. Disengagement-oriented coping significantly predicted increased negative affect. These findings increase understanding of motivations role in predicting athletes coping.

*Keywords:* Self Determination Theory, Cognitive Motivational Relational Theory, Sport, Coping

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**List of abbreviations**

SDT - Self Determination Theory

CMRT – Cognitive Motivational Relational Theory

HMIEM – Hierarchical Model of Intrinsic and Extrinsic Motivation

BNT – Basic Needs Theory

BRSQ – Behavioural Regulation in Sport Questionnaire

CICS – Coping Inventory for Competitive Sport

PANAS – Positive and Negative Affect Schedule

OIT – Organismic Integration Theory

CET – Cognitive Evaluation Theory

PLOC – Percieved Locus of Causality

COT – Causality Orientations Theory

## **Chapter 1: Introduction**

### **Importance of sport in Canadian Society**

Sport is a major part of Canadian society, as emphasised by sport participation levels within Canada, reported in the 2006-2007 sports monitor (Canadian Fitness and Lifestyle Research Institute [CFLRI], 2007). Results of this investigation showed that regardless of gender or age, 36% of Canadians were classified as sports participants. However, there is a large variance in sport participation depending on age and gender. Men generally participate in sport more than women, with 49% of men classified as sports participants, compared to only 25% of women (CFLRI, 2007). Additionally sport participation tends to decline greatly with age. Specifically between ages 15-17, sports participation is at 76%, between 18-24 it is at 49%, between 25-44 it is at 41%, between 45-65 participation it is at 30% and over the age of 65 it is at 20% (CLFRI, 2007). Regardless of this variance, sports participation is a major part of life for many (CFLRI, 2007).

Sport is a vital component of quality of life for many Canadians (Bloom, Grant, & Watt, 2005). Participation in sport and other physical activities has been shown to have a major positive influence on a number of outcomes (Bloom, et al., 2005). It has been shown that, on average, an active female sports participant expends an additional 586 kcal/week, and an active male sports participant expends an additional 1190 kcal/week (Bloom et al., 2005). These energy expenditures meet the targets for weekly energy expenditure required to support good health, showing that the average sports participant is adequately physically active (Bloom, et al, 2005). This sport participation, and subsequent increased physical activity, has been linked to a number of specific physical health benefits. Physical activity is linked to a reduction



in cardiovascular disease, as well as a reduction in the chance of death from a cardiovascular event by up to 50% (Myers, Kaykha, & George, 2004; Warburton, Nicol, & Bredin, 2006;). It has been shown that an increase in energy expenditure of 1000kcal per week is associated with a 20% decrease in mortality (Myers et al., 2004). Physical activity is also linked to reduced risk of osteoporosis, with weight bearing physical activity and high impact sports related to an increase in bone mineral density (Warburton, Gledhill, & Quinney, 2001). Physical activity is also related to a reduction in the prevalence of Type-2 diabetes, with each 500 kcal per week increase in energy expenditure linked to an additional 6% reduction in risk (Helmrich, Ragland, Leung, & Paffenbarger, 1991). Physical activity has also been linked to a reduced occurrence of certain cancers. For example, physically active men have been shown to have a reduced risk of colon cancer by 30-40%, and physically active females a reduced risk of breast cancer by 20-30% (Lee, 2003).

Additionally, sports participation has been linked to a number of specific psychological health benefits (Fox, 1999). It has been suggested that physical activity, in this case through sport, can be an aid to mental health from four perspectives (Fox, 1999). It can be used in the treatment and prevention of mental health issues and disorders, as well as for the improvement of mental and physical well-being disorders among those with mental disorders, and those in the general population without a diagnosed condition (Fox, 1999). Specifically increased physical activity has been shown to be vital in the treatment and prevention of depression and is an effective psycho-therapeutic method (Mutrie, 2000). A meta-analysis of clinical studies, in which exercise therapy was used to treat clinical depression, has yielded a large effect size of -0.72, showing that physical activity can play a crucial role in treating depression (Craft & Landers, 1998). Physical activity has also been linked to

reductions in state anxiety after a single bout, state and trait anxiety after a several week long physical activity programme, state anxiety when completing a task after an exercise bout (McDonald & Hodgdon, 1991; Petruzzello, Landers, Hatfield, Kubitz, & Salazar, 1991; Taylor, 2000), improved well being, mood and affect (Biddle, 2000), improved self esteem (Fox, 1999; Spence & Poon, 1997), improved self worth (Fox, 1999), improved cognitive performance (Boutcher, 2000; Etnier et al., 1997), and improved sleep quality of poor sleepers (Fox, 1999). Taking these findings into account it is clear that physical activity and sport can be a vital contributor to good mental health.

Data collected from the Conference Board of Canada's National Household Survey in Participation in Sport found that in addition to health benefits, there were three other crucial benefits to sport participation: skills impact, social impact and economic impact (Bloom, et al., 2005). Sport has a vital impact on individual skills; specifically, it helps individuals develop skills that are crucial in the work environment and skills that help individuals have a complete and happy family and community life. These skills include teamwork, leadership, problem-solving, decision making, communication skills, personal management and administrative skills (Bloom et al., 2005). Sport also plays a role in the development of a number of positive attitudes and values; these include respect and honesty, courage, fair play and character (Bloom et al., 2005). In addition, sport also has key social impacts; specifically it is vital in building social cohesion and in turn developing social capital and social networks. Sport also has a major economic impact on Canadian society. In an assessment made in 2004, it was shown that Canadian household spending on sport totalled \$15.8 billion, which equates to 2.18% of total household spending (Bloom et al., 2005)

Further research has assessed the importance of sport participation, but has focused on youth sport. A specific example of this focus is an investigation carried out in 2003 which found that most sport participants assessed felt that sport improved their health, helped them make friends, improved their self esteem, helped them succeed at school and helped them play a greater role within their family (Bloom et al., 2005)

Despite this relatively high level of sports participation within Canada, participation has in fact seen a decline. Using statistics from the period between 1992-2004, sport participation in adults has declined from 45% to 31% (Bloom et al., 2005). In addition to this drop in participation, Canadians are not finding alternatives to ensure that they are adequately physically active (Bloom et al., 2005). Evidence presented in the Canadian Community Health Survey (2005) has supported this claim. In this survey participants were classified into three categories: active, moderately active, and inactive. Results showed that only 27% of Canadians were physically active, 25% were moderately active and the remaining 48% were classified as physically inactive (Gilmour, 2007). Therefore a large number of individuals are missing out on the proven health benefits of physical activity. It has been estimated that health care spending that takes place specifically due to physical inactivity is approximately \$2.1 billion per year accounting for approximately 2.5% of all health care costs in Canada (Katzmaryk, Gledhill, & Shephard, 2000). Taking this fact into account, increasing the number of people participating in sport could lead to a major reduction in health care spending as well as ensuring that individuals gain all of the benefits from sports participation. Specifically, it has been suggested that a 10% reduction in physical inactivity could reduce expenditure on direct care by around \$150 million per year (Katzmaryk et al., 2000)

### **Importance of Affective Outcomes in Sport**

Affect is defined as an individual's conscious experience of an emotion (Panksepp, 2000). Positive affect can be defined as the extent to which a person feels enthusiastic, active and alert. Negative affect can be defined as a general distress and unpleasurable engagement. A person with high positive affect is in a state of high energy, full concentration and pleasurable enjoyment, whereas a person with low positive affect is generally sad and lethargic (Watson, Clark, & Tellegen, 1988). High negative affect includes negative mood states such as anger, disgust or fear. An individual with low negative affect is in a state of calm and tranquillity (Watson et al., 1988). Positive affective outcomes are strongly linked to continued sporting participation (McAuley et al., 2003)

A large number of factors play a crucial role in whether an athlete experiences positive or negative affective outcomes from sport. These include, but are not limited to, coping with stress (Crocker & Graham, 1995), level of self determined motivation (Vlachopoulos, Karageorghis, & Terry, 2000), passion (Vallerand, Rousseau, Grouzet, Dumais, Grenier, & Blanchard, 2006), motivational climate (Papaioannou, & Kouli, 1999), autonomy supportive coaching (Gagne, Ryan, & Bargmann, 2003), autonomy supportive environments (Edmunds, Ntoumanis, & Duda, 2006), basic need satisfaction (McDonough & Crocker, 2007), goal attainment (Smith, Ntoumanis, Duda, 2007) and learned helplessness (Boyd & Yin, 1996)

Affective outcomes of sport performance have been shown to play a key role to long term participation in sport and physical activity (McAuley, Jerome, Elavsky, Marquez, & Ramsey, 2003). Additionally, a review of 24 qualitative investigations into reasons for sport participation found enjoyment to be a key factor in why adults

and older adults partake in sport and exercise (Allender, Cowburn, & Foster, 2006). Affective outcomes include interest (Koestner, Ryan, Bernieri, & Holt, 1984), positive emotion (Ryan, & Connell, 1989), satisfaction (Vallerand et al., 1989) and anxiety (Ryan & Connell, 1989).

## **Theoretical Background**

### **Self determination theory.**

Athlete motivation has been shown to be a key contributor to sporting performance (Blanchard, Mask, Vallerand, Sablonniere, & Provencher, 2007), as well as to a number of cognitive, affective and behavioural outcomes of sporting performance, including positive and negative affect (Vallerand, 1997; Vlachopoulos, et al., 2000). Theoretical frameworks have been designed to give structure to the relationships between the antecedents of motivation and the outcomes of the subsequent motivation, specifically cognitive, affective and behavioural outcomes (Vallerand, 1997).

Self Determination Theory (SDT; Deci & Ryan, 1985) is a meta-theory of motivation designed to provide a framework for the analysis of the degree to which our behaviours are autonomous, and for self determined reasons, or controlled and for non-self determined reasons. Additionally, it aims to give structure to the relationships among personal and contextual factors and our level of self determined motivation in carrying out certain behaviours, and the subsequent consequences of these motivations. Importantly SDT posits that intrinsic and extrinsic motivation play vital roles in cognitive and social development, and that satisfaction of certain environmental factors can lead to better forms of motivation for engagement in

activities, and in turn, for example, enhanced performance and persistence (Ryan & Deci, 2002).

Throughout the psychology literature, theorists have proposed that individuals have an innate tendency to strive towards growth and integration (Ryan & Deci, 2002). This has been apparent within psychoanalytic, humanistic and cognitive psychology. However, there have often been theorists opposed to this assumption (Ryan & Deci, 2002). This includes the operant behaviourist viewpoint that states that personality development and behaviour are dependent on past reinforcement and current contingencies (Ryan & Deci, 2002). SDT takes into account both of these view points in a theory that is termed both organismic and dialectic.

SDT begins with the premise that individuals have an innate, constructive tendency to seek challenges within individual environments to achieve personal growth and development as well as a greater, more unified sense of self (Ryan & Deci, 2002). This involves striving for both autonomy (defined as an inner organisation and self regulation), and homonomy (defined as a tendency to integrate the self with others; Ryan & Deci, 2002). This is known as the organismic perspective. However, as previously stated, SDT also draws from the dialectic viewpoint that states that this personal growth and integration will only take place under certain social conditions, and that there are specific social-contextual factors, such as the social environment, that either help or hinder our innate tendency for growth and integration. This dialectic approach puts a major emphasis on a dynamic person-environment relationship (Ntoumanis, Edmunds, & Duda, 2009).

SDT comprises five mini theories which include Cognitive Evaluation Theory, Organismic Integration Theory, Causality Orientations Theory, Basic Psychological

Needs Theory and Goal Contents Theory (Ryan, & Deci, 2002). The first mini theory of Self Determination Theory is termed Cognitive Evaluation Theory (CET) (Ryan, & Deci, 2002). CET aims to describe the effects of social contexts on our intrinsic motivation (Ryan & Deci, 2002). Specifically, CET states that the social context affects individual's Perceived Locus of Causality (PLOC) and perceived competence, which in turn affect our intrinsic motivation. An internal PLOC and high perceived competence level are linked to enhanced intrinsic motivation, while an external PLOC and low perceived competence level are linked to thwarted intrinsic motivation (Ryan & Deci, 2002). Social factors in the environment are suggested to influence our PLOC and competence, and in turn our intrinsic motivation, depending on their controlling and informational aspects. Specifically social factors that are perceived as causing a controlling PLOC will thwart our intrinsic motivation, whereas social factors enhancing autonomy will assist our intrinsic motivation. Additionally, in terms of informational aspects, social factors that enhance our perceived competence tend to increase our intrinsic motivation, and those that are seen to reduce our perceived competence tend to reduce our intrinsic motivation (Ryan & Deci, 2002). Positive feedback is an example of a behaviour that can improve feelings of competence due to its informational aspect, but it is suggested that this only improves our intrinsic motivation if we are autonomous in the selection of the behaviour that we are receiving feedback on (Ryan & Deci, 2002).

The next mini theory of Self Determination Theory is termed Organismic Integration Theory (OIT) (*Figure 1*). OIT is based on the premise that it is in human nature to integrate our experiences, if the correct conditions are in place for us to do so. Specifically actions that are not intrinsically motivated are internalized and integrated into an individual's sense of self, if external motivators are used by

significant other or groups to encourage the carrying out of the specific activity (Ryan & Deci, 2002). This therefore means that individuals are then autonomous in carrying out this extrinsically motivated behaviour.

Self determination theory, specifically in OIT, differentiates motivation multidimensionally, on a continuum ranging from less to more self determined forms of motivation (Ryan & Deci, 2002). This is in contrast to the traditional dichotomous viewpoint in which motivation is either termed intrinsic or extrinsic (Ryan & Deci, 2002). The least self determined form of motivation is amotivation, which represents a complete absence of motivation. Amotivation is defined as a complete lack of the intention to act (Ryan & Deci, 2002). The next form of motivation on the continuum is extrinsic motivation. Extrinsic motivation involves engaging in an activity because it leads to some separate consequence, for example to gain tangible rewards or to avoid a punishment (Ryan & Deci, 2002). Extrinsic motivation varies in terms of self determination and the extent to which a behaviour has been internalized. According to OIT extrinsic motivation is multidimensional consisting of four differing kinds of motivation. The least self determined form of extrinsic motivation is external regulation, which is defined as behaviour that is carried out due to external environmental pressures or to avoid punishment and gain rewards. Next is introjected regulation, which is any behaviour that is carried out to avoid negative emotion and maintain individual self worth. This is followed by identified regulation, which is when behaviour is carried out because the outcomes of the behaviour, but not the actual behaviour, are in line with the individual's desires (Ryan & Deci, 2002). For example an athlete may be participating in his/her sport not because of the enjoyment gained from the actual performance but because he/she feels participation in this sport is crucial in growth and development and this is something valued very highly and is



perceived as desirable (Weinberg & Gould, 2007). Finally the most self determined form of extrinsic motivation is termed integrated regulation. Integrated regulation is a behaviour that is carried out as it has become fully internalized within the individual's self and represents who he/she is (Ryan & Deci, 2002).

According to SDT, after extrinsic motivation is the most self determined form of motivation, intrinsic motivation (Ryan & Deci, 2002). Intrinsic motivation involves engaging in an activity for rewards inherent to a task or activity itself. In sporting activity behaviour would be carried out for the love of the sport itself and the enjoyment gained from it (Ryan & Deci, 2002). It is suggested that the type of motivation that the individual has to carry out a behaviour, for example sports participation, is crucial in predicting the subsequent affective, cognitive and behavioural outcomes of that behaviour. More self determined forms of motivation are linked to more positive outcomes, for example affect (Vallerand, 1997).

The next mini theory of SDT is termed Causality Orientations Theory (COT). This theory is based on the proposition that an individual's motivation, behaviour and experience in a specific environment or situation is dependent on the social context and the individual's resources that he/she has developed through past interaction with the environment (Ryan & Deci, 2002). Specifically COT acts as a descriptive account of our inner resources, or our stable, trait like, motivational orientations that we generally have, which have developed as a result of past interaction within the social environment (Ryan & Deci, 2002). COT's goal is to solidify aspects of individual's personalities that are vital to the regulation of their behaviour (Ryan & Deci, 2002). COT describes three orientations, autonomous, controlled, and impersonal, which vary in the level that they represent self determination (Ryan, & Deci, 2002).

Autonomy orientation represents the extent to which individuals carry out behaviours due to personal values, and therefore represents an individual's trait-like tendencies to be intrinsically motivated or have integrated forms of extrinsic motivation. A controlled orientation depicts a tendency to base behaviour on external controls or directives. It is essentially an individual's personality trait towards being motivated for external or introjected reasons. Impersonal orientation relates to an individual's level of acting without intention, and is therefore related to individual tendencies to be amotivated (Ryan, & Deci, 2002)

The final mini theory of SDT, Basic Need Theory (BNT), is a mini theory of SDT which proposes that three basic psychological needs exist, and the degree to which these needs are satisfied promotes, and is essential in the development of more self determined forms of motivation and increased personal well being (Ryan & Deci, 2002). The basic needs are fundamental and essential for efforts of personal growth and development. Therefore, the proposal of the basic needs provides a platform from which the dialectic approach can be examined, as it is proposed that without their satisfaction, optimal growth, development and integration does not take place. The three basic needs proposed in BNT are autonomy, competence and relatedness. Autonomy can be defined as the feeling of choice and that one is the initiator of one's actions. Relatedness is the feeling that one is securely connected to and understood by others. The extent to which an individual shares the goals of team member or coaches also plays a key role in perceptions of relatedness. Competence is defined as the experience that one can effectively bring about desired effects and outcomes. It is the perception that you have the individual ability to achieve your goals (Ryan & Deci, 2002).

Also, in conjunction with a dialectic point of view, SDT suggests that the social environment is crucial in determining whether basic need satisfaction is enhanced or thwarted. Certain aspects within the social environment have been put forward in order to assess which specific factors can affect basic need satisfaction.

Autonomy support has been put forward as a key contributor to more self determined motivations. Autonomy support can be defined as a person in authority, such as a coach, giving a provision of choice to an athlete, acknowledging the athlete's perspective, as well as providing a meaningful rationale to the athlete for what is taking place (Ntoumanis, 2009). A second vital aspect of the social environment that plays a major role in basic need satisfaction is structure, which is defined as the extent to which an individual in authority gives optimal challenges, clear expectations and constructive feedback (Reeve, 2002). A final crucial environmental factor that plays a key role in basic need satisfaction is involvement. Involvement is defined as the level to which individuals in authority provide for those they interact with. Specific examples of psychological resources that can be provided by the coach include them giving their time and energy (Deci & Ryan, 1991). Facilitative social environments are, according to SDT, related to psychological need satisfaction and in turn, as previously stated, satisfaction of these needs is strongly related to more self determined forms of motivation (Deci & Ryan, 2002).

### **Hierarchical Model of Intrinsic and Extrinsic Motivation.**

Further theoretical frameworks have been put forward to assess the relationship between the antecedents of motivation, motivation and the consequences of motivation. An example of a model that aims to do this is the Hierarchical Model of Intrinsic and Extrinsic Motivation (HMIEM; Vallerand, 1997). The HMIEM,

which is strongly based on the premises put forward by Self Determination Theory, has been proposed by Vallerand (1997) in order to provide a framework allowing for organization and increased understanding of the basic mechanisms that underlie the processes involved in intrinsic and extrinsic motivation (Vallerand, 1997). As stated, the HMIEM is strongly based on SDT and incorporates the main points of this theory (Deci & Ryan, 1985). The model postulates that all proposed relationships take place over three hierarchical levels of generality. These levels explain how intrinsic, extrinsic and amotivation exist at a global, contextual and situational level.

Motivation at a global level is a general, enduring motivational orientation to interact with the environment in an intrinsic, extrinsic, or amotivated manner (Vallerand, 1997). Motivation at a contextual level is an individual's usual motivation in a specific context. Examples of context include work, leisure, education and sport (Vallerand, 1997). Finally, situational motivation can be defined as motivation when an individual is currently engaging in an activity (Vallerand, 1997). The model also proposes an interaction between these three levels of motivation (Vallerand, 1997).

Vallerand (1997) proposed five postulates which aim to explain the HMIEM (Vallerand, 1997). The first postulate is that for an analysis of motivation to be complete it must take into account intrinsic motivation, extrinsic motivation and amotivation. The second states that intrinsic motivation, extrinsic motivation and amotivation exist at a global, contextual and situational level of generality. The third postulate of the HMIEM states that motivation is dependent on and determined by two factors. The first is social factors, which include human factors such as coaching behaviour, and non-human factors such as the playing surface. These social factors influence motivation via the mediation of the basic needs. The second factor that has a role in determining motivation is the top down effects of the above level in the

hierarchy. Specifically, our global motivation has an effect on our contextual motivation, and our contextual motivation affects our situational motivation. The fourth postulate states that on top of the previously stated top down relationship between the hierarchical levels of motivation, there is also a recursive bottom up relationship between motivation at a specific level in the hierarchy, and the level of motivation immediately higher in the hierarchy. Finally the fifth postulate put forward states that motivation leads to a number of important consequences (Vallerand, 1997).

Using the five postulates, the main outline of the model (See Figure 2) is shown to be that social (i.e., global, contextual or situational) factors predict our hierarchical levels of global, contextual or situational motivation, in a relationship that is mediated by the satisfaction of our basic psychological needs. In turn our motivation, whether intrinsic, extrinsic, or amotivation, has specific affective, behavioural and cognitive consequences (Vallerand, 1997). Examples of cognitive outcomes include concentration or attention (Vallerand, Blais, Briere, Pelletier, 1989), and memory and conceptual learning (Benware, & Deci, 1984). Behavioural outcomes include persistence (Vallerand & Bissonnette, 1992), intensity (Harter, 1978), behavioural intention (Vallerand, Fortier, & Guay, 1997) and performance (Fortier, Vallerand, & Guay, 1995). Coping with stress is an example of both a cognitive and behavioural outcome (Lazarus & Folkman, 1984). Affective outcomes include interest (Koestner, Ryan, Bernieri, & Holt, 1984), positive emotion (Ryan, & Connell, 1989), satisfaction (Vallerand et al., 1989) and anxiety (Ryan & Connell, 1989).

### **Coping with stress in a sporting environment.**

It has been suggested that motivation may be a key factor in the selection of coping strategies in order to deal with a troubled person-environment relationship (Lazarus, 1991). Coping can be defined as the process of constantly changing cognitive and behavioural efforts to manage specific and internal demands or conflicts which are appraised as taxing or exceeding resources of the person (Lazarus and Folkman, 1984). It has been suggested by Lazarus (1991) that any research on athlete coping must consider the motivational antecedents that lead to the selection of a particular coping strategy (Lazarus, 1991). This suggestion is supported by the HMIEM as it hypothesizes that motivation leads to cognitive, affective and behavioural outcomes and the definition of coping defines coping as both a cognitive and behavioural response (Lazarus, 1991; Vallerand, 1997). Importantly, an additional framework (see figure 4) has been put in place, through an integrated model, to give structure to the possible relationship between motivation, specifically SDT, and coping with stress, specifically Cognitive Motivational Relational Theory, which will be further detailed later in the document (Ntoumanis, Edmunds, & Duda, 2009).

Additionally, coping with stress has been shown to be a key factor in both sporting performance and emotional outcomes of sporting participation, due to the highly stressful environments created by the pressures of winning or losing (Gaudreau & Blondin, 2004; Gould, Jackson, & Finch, 1993).

Despite there being no proposed relationship between cognitive, behavioural and affective outcomes in the HMIEM, other theorists have suggested that coping may be strongly linked to emotional, and therefore affective outcomes (Vallerand, 1997; Lazarus, 1999). In order to capture the coping process as a whole and assess

how the selection of coping strategies can have a role in personal emotional outcomes, Lazarus (1999) developed his Cognitive Motivational Relational Theory (CMRT) (See Figure 3). CMRT states that the relationship between stress, coping and emotion is a strongly linked dynamic process, based around transactions between people and the environment (Lazarus, 1999). CMRT states that cognitive appraisal is vital in these relationships and there are two parts to this appraisal process (Lazarus, 1999). According to Lazarus (1999), when faced with a stressful situation an individual will evaluate its potential personal relevance and how it might impact on his/her goals (Ntoumanis, Edmunds, & Duda, 2009). This was termed primary appraisal by Lazarus (1999). Lazarus and Folkman (1984) distinguished four ways that the environment could be primarily appraised. These were harm (the damage that has already been done), threat (the potential for harm in the future), challenge (an opportunity for growth and mastery), and benign (where no further action is required) (Ntoumanis et al., 2009). Generally, harm and threat appraisals are associated with mostly negative emotions, whereas challenge is associated with positive emotional outcomes (Ntoumanis et al., 2009). Lazarus (1999) suggested that after primary appraisal, secondary appraisal takes place. This consists of a 'weighing up' of an individual's perceived coping options in order to deal with a specific stressor. Secondary appraisal is made up of an assessment of: blame or credit (who is responsible for the stressor); coping potential (a person's belief of his/her ability to cope with harm or threat, or be able to gain positive outcomes from challenging situations); and future expectancies (whether the individual believes the situation will get better or worse; Jones & Uphill, 2004; Lazarus, 1991; 1999; Uphill & Jones, 2004).

After appraisal has taken place, coping will take place if necessary (Lazarus, 1999). Different stress appraisals lead to differing coping responses and it has been

shown in the literature that there are a large number of coping strategies available to deal with each stressor (Ntoumanis et al., 2009). Lazarus and Folkman (1984) defined two main types of coping strategies. These are problem-focused and emotion-focused strategies (Lazarus & Folkman, 1984). Problem-focused coping strategies can be defined as any attempt to solve or manage a stressful encounter, whereas emotion focussed coping strategies can be defined as those designed to manage emotional distress that can result during a stressful encounter (Lazarus, 1999). It has been more recently suggested that these coping subscales can be regrouped as a coping style labelled task-oriented coping as they have both been shown to lead to generally positive outcomes in time of stress, are constructive in dealing with stressors or with our reaction to them, and can be considered organised, flexible and constructive (Skinner, Edge, Altman, & Sherwood, 2003; Amiot, Blanchard, & Gaudreau, 2007). A further higher order dimension has been proposed and termed Disengagement-Oriented Coping, which is defined as any coping strategy aiming to disengage oneself from the task and focus on cues that are irrelevant to the task (Skinner, et al. 2003; Amiot, Gaudreau, & Blanchard, 2004; Amiot et al., 2007). Disengagement-oriented coping has been suggested to be rigid, disorganised and derogatory, and to deal with the stressful situation too harshly, rendering it to be associated with less positive outcomes (Amiot, et al., 2004). Disengagement-oriented coping is represented by strategies such as behavioural disengagement, denial, and the use of alcohol or drugs. Coping results in an event outcome which can be deemed positive (e.g. resolving the stressor), negative (e.g. increasing stress), or it cannot resolve the stressful situation (Nicholls, Jones, Polman, & Borkoles, 2009). As previously stated, it is suggested that, under conditions of control, task oriented coping is suggested to alleviate the negative impact of stress and lead to positive consequences, whereas disengagement



oriented coping is suggested to make the effects of stress worse and lead to generally negative consequences (Compass, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001).

The combination of primary and secondary appraisal represents proximal determinants of athletes' emotions and therefore the intensity and type of emotion generated (Lazarus, 1991; Uphill and Jones, 2007). Coping is also crucial and influences which emotions occur and how they will change (Lazarus, 2000). Emotion is generated throughout the appraisal and coping process and as a result of the outcome (Lazarus, 2000). With successful coping outcomes, positive emotions occur, whereas with unfavourable outcomes, negative emotions occur (Folkman & Moskowitz, 2004).

It has been emphasised that there is no specific coping strategy that is better than another, and there are no universally appropriate coping strategies. Lazarus (1999) states that coping is a dynamic process containing large inter-individual or intra-individual variability, therefore different people utilise differing coping strategies in the same situation, and individuals use different coping strategies depending on the environment and their appraisal of it (Lazarus, 1991).

It is clear that there is a potential framework for the relationships among motivation, coping, and affective outcomes in place. Self determination theory (Deci & Ryan) and the HMIEM (Vallerand, 1997) suggest that more self determined forms of motivation are linked to a number of positive outcomes such as positive affect. In addition, the HMIEM (Vallerand, 1997) also suggests that the type of motivation that individuals have, globally, contextually and situationally, will also have cognitive and behavioural outcomes. As coping is defined by Lazarus and Folkman (1984) as both

cognitive and behavioural, coping has been outlined as an example of cognitive and behavioural outcomes. Therefore the HMIEM gives support for a relationship between an individual's level of self determination and the specific coping strategies he/she uses. Additionally, the relationship between coping and affect is suggested by CMRT, as the theory suggests that coping with stress has a key role in an individual's emotions, and therefore affect (Lazarus, 1999).

As previously stated an integrated model (see figure 4) has been proposed to outline how SDT and CMRT, are interrelated (Ntoumains et al., 2009). This model is therefore in support of Lazarus's assumption that motivation is a key factor in the selection of coping strategies in order to deal with a troubled person-environment relationship (Lazarus, 1991) The model proposes a sequence, however it is stated that it should only be used for descriptive purposes, as Lazarus (1999) states that motivation, appraisal, coping, stress and emotion are conjoined and should only be separated for the purpose of discussion, (Ntoumanis et al., 2009). The integrated model is based on the premise that an assessment of the motivational processes involved in the coping process should account for personal factor involved in volition, choice and self determination in goal striving as well as the role of socio-contextual factors in helping or hindering these goals (Ntoumanis et al., 2009). Initially the model states that our stress appraisals, whether we view an environmental demand as threat, harm or challenge is strongly influenced by ranging constraints, demands and resources. Additionally our primary and secondary appraisals are also influenced by how supportive of the three basic needs the immediate environment that we are in is. Specifically, our appraisals are directly influenced and indirectly influenced (via basic need satisfaction) by our perception autonomy support, structure and involvement within an environment, with more autonomous environments leading to increased

appraisals of challenge and more controlled environment leading to increased appraisals of threat or harm (Ntoumanis et al., 2009). Stress appraisals are also directly influenced by the satisfaction of the three basic needs. Specifically when individuals feel high levels of autonomy, competence and relatedness they are more likely to perceive demands and constraints put on our goals as challenges, rather than threats or harm. (Ntoumanis et al., 2009) Additionally, it is proposed that basic need satisfaction is also linked to increased secondary appraisals of control. The model also proposes that motivation, in terms of an individual's self determination, directly influences stress appraisals, with more self determined motives resulting in more positive stress appraisals than non-self determined motivations. Finally, in terms of appraisal the model also proposes the vital influences of certain personality factors, such as causality orientations or coping styles, in shaping our appraisals, motivation and coping (Ntoumanis, et al., 2009).

The model proposes, in line with CMRT, that coping responses are influenced by our stress appraisals and our associated emotional responses to these appraisals. Specifically it is proposed that stress appraisals of challenge and control should facilitate positive emotions and problem focused coping strategies, whereas appraisals of harm, loss and a lack of control, predict negative emotions and emotion focused coping strategy use (Ntoumanis et al., 2009). There is no direct relationship proposed between motivation and coping, within the model and motivation is said to influence coping in a relationship that is mediated by stress appraisals as all coping responses first require an appraisal of the stressful situation (Ntoumanis et al., 2009). Finally the model suggests that effective coping responses, with effectiveness determined by process rather than outcome, lead to a variety of positive health, well being, cognitive, affective and behavioural outcomes (Ntoumanis et al., 2009).

## **Relevant Past Research**

Research has been put forward, within a sporting context, to assess the proposed relationships, within SDT and the HMIEM, that have been discussed previously. There is at present a large amount of research assessing the HMIEM's initial proposed relationship. This relationship, within the HMIEM, states that social factors predict the level of motivation in a relationship which is mediated by basic need satisfaction (Vallerand, 1997). Research, in a number of sports setting, with varying populations of athletes, has found a link between social factors, specifically autonomy support and involvement, satisfaction of the basic psychological needs, and in turn self determined motivation. Autonomy support has been linked to satisfaction of the basic needs, and in turn more self determined motivation, amongst male adolescent athletes (Reinboth, Duda, & Ntoumanis, 2004), adult sport participants (Adie, Duda, & Ntoumanis, 2008), high school and college athletes (Amorose & Anderson- Butcher, 2007), young soccer players (Alvarez, Balaguer, Castillo, & Duda, 2009), and gymnasts (Gagne, Ryan, & Bargman, 2003). Additionally, coach involvement has been linked to basic need satisfaction amongst gymnasts (Gagne, Ryan & Bargman, 2003)

Additionally, research that did not assess basic need satisfaction has found that the social factor of coach autonomy support is strongly linked to more self determined forms of motivation in the sporting domain. This has been shown amongst Judokas (Gillett, Vallerand, Amoura, & Blades, 2010) and Canadian swimmers (Pelletier, Fortier, Vallerand, & Briere, 2002).

The mediating role of the basic psychological needs in the relationship between social factors and motivation has also been shown using the social factor of

autonomy support. Specifically, full mediation of the relationship between autonomy support and motivation by basic need satisfaction has been shown amongst high school and college athletes (Amarose & Andersson Butcher, 2007), Spanish youth soccer players (Alvarez et al., 2009), and basketball players (Blanchard et al., 2009).

Research has also focused on the cognitive, affective and behavioural outcomes that are proposed by the HMIEM to come as a consequence of motivation (Vallerand, 1997). As stated earlier, motivation may have a crucial role to play in determining athletes' coping strategies. Additionally, this suggestion is supported by the integrated model put forward by Ntoumanis et al. (2009) and the HMIEM as it hypothesizes that motivation leads to cognitive, affective, and behavioural outcomes, and coping is both a cognitive and behavioural response (Lazarus, 1991; Vallerand, 1997). There is currently limited sports specific research assessing this relationship and to date there are only two studies aiming to link self determined motivation and coping strategies within the sporting environment. Within an athletic context Amiot et al. (2004) set out to assess the motivational antecedents and outcomes of the coping process. In order to do this, a population of regional, provincial and national alpine skiers, swimmers, soccer players, basketball players and badminton players, was examined. They assessed motivation in terms of athletes' level of self determination to participate in sport. Specifically, intrinsic motivation and identified regulation were classified as self determined motivation and amotivation and external regulation were classified as non self determined. Introjected regulation was not included in either of the composite factors. Results showed that self determination to perform in sport positively predicted the use of task-oriented coping strategies. In addition to this finding, non-self determined motivation significantly predicted increased use of disengagement-oriented coping strategies. To date, this is the only study to assess the

effects of self determined motivation on coping strategies within a sporting context in non-disabled athletes. However, further research has assessed this relationship amongst wheelchair basketball players (Perreault & Vallerand, 2007). Specifically, this study aimed to assess the motivation and coping skills of female and male wheelchair basketball players, with and without a disability. In this investigation, coping skills were defined as adaptive, task-oriented coping strategies such as goal setting and increasing concentration. Results showed that self determined motivation predicted coping skill, with more self determined motivation linked to increased coping skill, and low levels of self determination linked to low coping skills. (Perreault & Vallerand, 2007).

Additionally, outside of the sporting domain, research has yielded similar results. Specifically, more self determined levels of motivation were linked to less defensive-based coping strategies whereas more controlled motives were linked to more defensive coping strategies in an academic setting of an examination, using a sample of psychology students (Knee & Zuckerman, 1998). Along with this finding, in romantic relationships, more self determined types of motivation have also been linked to more adaptive, relationship saving, coping strategies. Additionally, less self determined motivation was linked to higher levels of denial (Knee, Patrick, Victor, Namayakkara, & Neighbours, 2002). Finally, research assessing the coping strategies used by university students during their transition to university has taken place. Results have shown that students' level of global self determination in their motivation predicted increased use of task-oriented coping strategies, and reduced use of disengagement-oriented coping strategies (Amiot et al, 2007). Although lacking in quantity, specifically in the sporting environment, when taking this past research into account it appears that, in general, self determined motivation is positively related to

more task-oriented, adaptive coping strategies, whereas non self determined motivation is positively related to disengagement-oriented coping strategies. This again corresponds with the hypothesised relationships, within the integrated SDT and CMRT model and within HMIEM, between motivation and cognitive and behavioural outcomes as coping is defined as a cognitive or behavioural response (Folkman & Moskowitz, 2004; Ntoumanis et al., 2009; Vallerand, 1997). However, none of this previous research conceptualised motivation in a manner strictly guided by the components of motivation proposed by OIT, as it was the case that either not all of the proposed motivations were included or that the proposed components were further categorised into higher order factors of either self determined or non-self determined. It is therefore not clear what the exact importance is for each level of motivation within the OIT continuum (Ryan, & Deci, 2002).

Research has also found athletes' affective outcomes of performance to be affected by motivation. More self determined motivation has been shown to be related to more positive affect (Gagne et al., 2003), increased well-being (Solberg & Halvari, 2009), increased enjoyment and reduced boredom (Alvarez et al, 2009), and positive emotions and satisfaction (Blanchard et al., 2009). In sporting contexts, less self determined motivation has been positively related to negative affect (Gagne et al., 2003) and a reduction in all previously stated positive variables (Alvarez et al., 2009; Blanchard et al., 2009; Solberg & Halvari, 2009). All these findings were in specific sporting contexts. The relationship between motivation and affective outcomes is again in line with the HMIEM (Vallerand, 1997)

Along with these previously stated findings, basic need satisfaction has also been linked to more positive outcomes. Specifically, satisfaction of the three basic

needs has been related to greater vitality when engaged in sport (Adie et al., 2008), and positive and negative affect in dragon boat racers (McDonough & Crocker, 2007). A study on male adolescent cricketers and soccer players carried out by Reinboth, Duda, and Ntoumanis (2004) showed a partial relationship between satisfaction of the basic needs and well-being. Specifically, perceived autonomy and competence were positively related to increased well-being. However, the satisfaction of the need for relatedness was not shown to be related to well-being (Reinboth, Duda, & Ntoumanis, 2004). Also, it has been shown that well-being varied from pre to post gymnastic training, systematically with basic need satisfaction (Gagne et al., 2003).

As stated within CMRT by Lazarus (1999), there are links between coping strategies and emotional outcomes. Empirical research has assessed this proposed relationship. Specifically, task-oriented coping strategies have been linked to increased positive and reduced negative affect, whereas disengagement-orientated coping strategies have been linked to reduced positive and increased negative affect (Hoar, Kowalski, Gaudreau, & Crocker, 2006). This has been shown amongst British university athletes (Ntoumanis, Biddle, & Haddock, 1999) and a mixed demographic group of athletes (Crocker & Graham, 1995). Additionally Gaudreau and Blondin (2004) found task-oriented coping to be linked to a reduced level of anger and dejection, increased positive affect and increased feelings of control. Additionally Gaudreau and Blondin (2002) reported that task-oriented coping shared an average of 18% of the variance in positive affective outcomes, whereas disengagement-oriented coping shares 15% of the variance with negative affect, on average. Assessment of the relationship between coping and affect goes beyond the hypothesised relationships within the HMIEM. The HMIEM suggests that cognitive and behavioural (coping) and affective (positive and negative affect) outcomes exist as a result of motivation,



but it does not hypothesise that these variables are related (Valerand, 1997). However, this relationship is in support of Lazarus's CMRT (1999) which states that coping and emotion are strongly linked.

### **Research Caveats**

Taking into account the past research presented, it is clear that certain gaps lie within it. As stated, there is currently a large amount of research assessing the relationship between specific social factors, basic need satisfaction and motivation. However, there is less research assessing the relationship between motivation and certain specific motivational outcomes. Specifically, there is a lack of research assessing the relationship between motivation and the resultant coping strategies that are used to cope with stress within the sporting environment. Additionally, the previous research has not included all the levels of motivation proposed within OIT, or combined them, to assess motivation as either self determined or non self determined. Therefore, little is known about the relationship between the specific forms of motivation proposed by OIT and its relationship with coping with stress. There is also a lack of research assessing how the relationship between motivation and coping with stress can affect the affective outcomes athletes get from sporting performance. Additionally, the relationship between coping and affective outcomes has been researched and proposed by CMRT (Lazarus, 1999). However, this relationship has not been proposed within the HMIEM as the model does not include a relationship between cognitive, affective, and behavioural outcomes of motivation. A large amount of research has assessed the relationship between coping with stress and emotional outcomes. However, relatively few studies have assessed this

relationship while accounting for the athletes level of self determination in their motivation.

## **Purpose**

Accounting for past theory and research there were multiple purposes to the investigation:

The first purpose of the investigation was to assess the relationship between athlete motivation to perform in competitive sport and the specific psychological outcomes that take place as a result of this sporting performance. This involved assessment of two relationships. The relationship between athlete motivation and the coping strategies that they used to cope with stress during the sporting performance was assessed. Coping is defined as a cognitive and behavioural response, and according to the integrated model put forward by Ntoumanis et al. (2009) and the HMIEM, it is suggested that motivation and coping with stress may be interrelated (Lazarus & Folkman, 1984; Vallerand, 1997). Additionally, no research has previously assessed this relationship using all the individual levels of motivation proposed within OIT, and it was therefore a purpose of the investigation to see the relationship between each individual level and coping with stress. Secondly, the investigation aimed to assess the relationship between motivation to perform in sport and affective outcomes as a result of the sporting performance. Specifically athletes' level of positive and negative affect was measured.

The secondary purpose of this investigation was to assess the relationships between specific examples of outcomes of motivation. Specifically, in this case, the relationship between the type of coping strategies used by the athletes in order to deal with stress within their sporting performance, and the affective outcomes of that

sporting performance was assessed. This relationship was vital to assess as it is not accounted for within the HMIEM, but has been proposed by other theories, specifically, in this case, CMRT.

## **Hypothesis**

The purpose of this investigation was approached using 3 hypotheses:

### **Hypothesis 1.**

More self determined motivations will positively predict task-oriented coping strategies and negatively predict disengagement-oriented coping strategies. Less self determined motivations will positively predicted disengagement-oriented coping strategies and negatively predict task-oriented coping strategies. Lazarus (1991) has previously stated that any assessment of how an individual copes with stress should take into account his/her motivational antecedents, and an integrated model has been put forward Ntoumanis et al. (2009) aiming to combine SDT and CMRT and therefore give structure to the relationship between motivation and coping. Additionally, the HMIEM (Vallerand, 1997) states that motivation is linked to cognitive and behavioural outcomes, of which coping with stress is an example of both. This direction of the hypothesised relationship is supported specifically by research within the sporting (Amiot et al., 2004; Perreault & Vallerand, 2007), educational (Knee & Zuckerman, 1998; Amiot, Blanchard, & Gaudreau 2007), and romantic relationship domains (Knee et al., 2002), which have previously shown the proposed relationship.

The specific hypothesised relationships were as follows:

- a. Amotivation was negatively related to task-oriented coping.

- b. Amotivation will be negatively related to disengagement oriented-coping
- c. External regulation will be negatively related to task-oriented coping.
- d. External regulation will be positively related to disengagement-oriented coping.
- e. Introjected regulation will be negatively related to task-oriented coping.
- f. Introjected regulation will be positively related to disengagement-oriented coping.
- g. Identified regulation will be positively related to task-oriented coping.
- h. Identified regulation will be negatively related to disengagement-oriented coping.
- i. Integrated regulation will be positively related to task-oriented coping.
- j. Integrated regulation will be negatively related to disengagement-oriented coping.
- k. Intrinsic motivation will be positively related to task-oriented coping.
- l. Intrinsic motivation will be negatively related to disengagement-oriented coping.

### **Hypothesis 2.**

More self determined motivation will predict increased levels of positive affect as well as reduced levels of negative affect. Less self determined motivation will predict lower levels of positive affect as well as increased levels of negative affect. This hypothesis is supported by the HMIEM (Vallerand, 1997) which states that motivation is a predictor of affective outcomes. Additionally, SDT states that more self determined motives for participation lead to more positive outcomes of

sporting performance, for example, affect. Specific research amongst athletes has shown support for this relationship.

Specifically the hypothesised relationships were:

- a. Amotivation will be negatively related to positive affect.
- b. Amotivation will be positively related to negative affect.
- c. External regulation will be negatively related to positive affect.
- d. External regulation will be positively related to negative affect.
- e. Introjected regulation will be negatively related to positive affect.
- f. Introjected regulation will be positively related to negative affect.
- g. Identified regulation will be positively related to positive affect.
- h. Identified regulation will be negatively related to negative affect.
- i. Integrated regulation will be positively related to positive affect.
- j. Integrated regulation will be negatively related to negative affect.
- k. Intrinsic motivation will be positively related to positive affect.
- l. Intrinsic motivation was negatively related to negative affect.

### **Hypothesis 3.**

Increased use of task-oriented coping strategies to cope with stress in sporting performance will be related to increased positive affective outcomes as well as reduced negative affective outcomes of sporting performance. Increased use of disengagement-oriented coping strategies will result in increased negative and decreased positive affective outcomes to sporting performance. The relationship between coping and affective outcomes was proposed by Lazarus as part of his CMRT (Lazarus, 1999), which states that the type of coping strategy selected has a

major influence in the emotional outcomes of the transaction with the environment.

Additional empirical research has given support to this relationship amongst athletes.

The specific hypotheses are:

- a. Increased use of task-oriented coping strategies will be positively related to positive affect.
- b. Increased use of task-oriented coping strategies will be negatively related to negative affect.
- c. Increased disengagement-oriented coping will be negatively related to positive affect.
- d. Increased use of disengagement-oriented coping will be positively related to negative affect.

## Chapter 2 – Methods

### Participants

Participants were recruited from a population of university athletes competing within Canadian Interuniversity Sport (CIS), and Ontario University Athletics (OUA), initially from Brock University, and additionally from the Queen's University Men's Rugby Team, using a convenience sampling method. The CIS consists of 10 men's and 11 women's sport competitions, all taking place on a Canada wide level. The CIS is split up into 4 area dependent divisions, specifically: Atlantic University Sport, Canada West, Ontario University Athletics, and the Quebec Student Sport Federation. The men's sports include Cross Country (34 schools), Curling (11 schools) Football (26 schools), Soccer (42 schools), Hockey (34 schools), Basketball (42 schools), Swimming (33 schools), Track & Field (30 schools), Volleyball (27 schools) and Wrestling (14 schools). The 11 women's sports consist of Cross Country (36 schools), Curling (11 Schools), Field Hockey (13 schools), Soccer (45 schools), Rugby (24 schools), Basketball (42 schools), Hockey (29 schools), Swimming (33 schools), Track & Field (31 schools), Volleyball (36 schools) & Wrestling (14 schools). Sports that do not have full CIS status, but still compete at an OUA level were also included in the sports available for assessment. These sports included men's rugby, baseball, and rowing. Brock University has teams representing all CIS sports except, men's football, men's volleyball, men's track and field, women's track and field and women's field hockey.

Additionally, and importantly to the current investigation, CIS and OUA sport is often highly competitive and close fought, which renders it an environment where high

stress amongst the competing athletes is likely. This is crucial as it therefore provided an environment in which coping with stress was necessary, therefore making this a good population to use in order to assess the variables in the current investigation.

### **Procedure**

Data collection took place in numerous fashions. Initially coaches of the individual university teams were approached in order to gain permission for the use of their team in data collection. This was done via email. Upon receiving approval from the coaches, emails were sent out to all individuals on the teams that gave their approval, or were approached at the completion of a team training session and given a paper questionnaire package if the teams were still in season. The emails included a statement about the investigation and a link to a web-based questionnaire package. Upon clicking on this link participants were initially sent to a letter of invitation/consent form. This included a statement on the aim of the investigation, what was required of the participant, potential benefits or risks, confidentiality, the voluntary nature of the participation, their right to withdraw at any time, and contact information of the investigators. The letter of invitation also included a paragraph on the informed consent of the participants, stating that by continuing onto the questionnaire section that they gave their consent and agreed to participate in this study described above. The web based questionnaire package involved an assessment of the athlete's demographics, motivation to perform in their sport in general, the coping strategies used to deal with stress in his/her last competitive match, and affective state during this performance. The paper questionnaire packages that in season athletes were given consisted of an identical letter of invitation/consent and



questionnaires as the web based version. Upon completion, the athlete's results were used confidentially for subsequent data analysis.

Additionally to increase the sample size, varsity athletes, who were enrolled in an undergraduate sports psychology class and had not already completed the questionnaires, were approached during a lecture. These classes contained a research participation component and participation in my study counted towards this. Varsity athletes who agreed to participate were sent a link to the online questionnaire package.

## **Design**

The investigation's design was non experimental, as no manipulation was made and no attempt to further control the environment was made. Experimental designs in sport are often difficult due to its competitive nature making it difficult to make manipulations, as any manipulations can have a major effect on team or individual performance. The investigation was also cross sectional, meaning that data only represented the specific participant at that one point in time. Due to the non experimental and cross sectional design of the investigation it was not possible to infer causality in the relationships between the variables, this was the case as, due to the real world setting of the data assessment, no controls were put in place over any possible extraneous variables and, due to the fact that all measures were made at once a temporal aspect could not be established between the variables. Therefore conclusions made from the data analysis should be made with caution.

## **Measures**

Questionnaires were completed assessing athletes' demographics, their motivation to perform in their sport, their coping strategies to deal with stress during sporting performance, and their affective outcomes.

### **Demographics.**

Initially general information was collected about the participants. They were asked to provide their age, gender, sport, years of experience, highest level of competition, number of hours per week playing their sport, their position on the team as a starter or non-starter, their year of eligibility, and the length of time since their last sporting performance.

### **Self determined motivation.**

Athletes' levels of self determined motivation towards performing competitively in their sport in general, were measured using the 24-item Behavioural Regulation in Sport Questionnaire (BRSQ). Therefore a trait measure of motivation was made, measuring motivation at a contextual level, according to the HMIEM (Vallerand, 1997). The BRSQ was designed to measure competitive athlete's intrinsic motivation, extrinsic motivation and amotivation, consistent with the tenets of OIT within SDT (Lonsdale, Hodge, & Rose, 2008). The BRSQ contains a series of questions assessing a number of types of motivation, each containing six items. These subscales include amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and general intrinsic motivation. All questions began with the stem 'I participate in my sport...'. Example questions are as follows: intrinsic motivation in general, 'I participate in my sport because I enjoy it'; integrated regulation, 'I participate in my sport because it is part of who I am'; identified regulation, 'I participate in my sport because the benefits of sport are important to

me'; introjected regulation, 'I participate in my sport because I would feel ashamed if I quit'; external regulation, 'I participate in my sport because if I don't other people will not be pleased with me'; and amotivation, 'I participate in my sport but I wonder what's the point.' Questions are answered on a seven-point scale with one representing the statement 'not at all applicable', and seven representing the statement 'very true'.

Evidence has suggested that the BRSQ is appropriate for use with both elite and non elite competitive athletes. Validation studies have shown the internal consistencies of the constructs within the BRSQ to be acceptable. An example of an investigation that aimed to do this was carried out by Lonsdale et al. (2008). Sports participants at New Zealand Universities ( $n=316$ ), who played in a total of 38 different sports completed the BRSQ, Sports Motivation Scale and the Athlete Burnout Questionnaire. Internal consistencies were shown to be of an acceptable level for all of the scales ( $\alpha=.78-.91$ ) (Lonsdale et al. 2008). Additionally, a further study, presented in the same article as the previous example has shown similar findings. This was carried out on New Zealand amateur rugby players who were members of three clubs ( $n=34$ ). Again, internal consistency results were shown to be acceptable for all the subscales of the BRSQ ( $\alpha=.73-.90$ ) (Lonsdale et al., 2008).

### **Coping with stress.**

The Coping Inventory for Competitive Sport (CICS) was used to assess the coping behaviour of athletes during their last competitive sporting performance in their sport (Gaudreau & Blondin, 2002). Therefore coping was measured at a state level and therefore, according to the HMIEM, on a situational level (Vallerand, 1997). The questionnaire consisted of 39 statements about the athletes' coping behaviours

during their performance, and participants rated whether the statement corresponded to them, using a one-five Likert scale, with one being “not at all”, and five being “very strongly”. The CICS was designed to examine 10 coping strategies, and internal consistencies have been assessed in previous research. The ten subscales consist of thought control ( $\alpha=.72$ ), mental Imagery ( $\alpha=.74$ ), relaxation ( $\alpha=.80$ ), effort expenditure ( $\alpha=.79$ ), logical analysis ( $\alpha=.67$ ), seeking support ( $\alpha=.70$ ), social withdrawal ( $\alpha=.71$ ), mental distraction ( $\alpha=.76$ ), disengagement/resignation ( $\alpha=.68$ ) and venting of unpleasant emotions ( $\alpha=.87$ ) (Richards, 2004). As shown by the presented Cronbach alpha scores eight of the ten subscales have been shown to have adequate internal consistency and two subscales had internal consistency considered moderately low. Additionally, the CICS has been shown to have adequate convergent, concurrent and differential validity, and results of a factor analysis have supported the 10 factor model (Gaudreau & Blondin, 2002)

It has been suggested by coping theorists that these coping subscales can be further categorised into second order coping strategies, such as task-oriented and disengagement-oriented coping (Amiot, Gaudreau, & Blanchard, 2004). An exploratory factor analysis was carried out to regroup the 10 CICS factors, using the data collected in the investigation, as using a 10 factor model would lead to a lack of parsimony in the analysis for this study, making it very difficult to draw conclusions from the results of the investigation (Skinner, 2003). Previous research assessing similar variables, with a mixed sample of athletes much like the current study, also aimed to create second order factors of the 10 CICS factors using an exploratory factor analysis (Amiot et al., 2004). The design of the exploratory factor analysis used in this previous research was used to structure the exploratory factor analysis carried out in the current investigation. A confirmatory factor analysis could not be carried

out, as the sample size in the current study was not large enough for a confirmatory factor analysis to be appropriate (Tabachnick & Fidell, 2008). Taking this into account, and using the previous study as a guide, a principal components analysis with oblimin rotation was carried out. Due to the fact that Amiot et al. (2004) found a two-factor model in their exploratory factor analysis, the factor analysis in the current investigation was forced into a two-factor solution.

### **Affective outcomes.**

Athlete's levels of positive and negative affect were measured to assess their affective outcomes experienced during their last sporting performance. Therefore Affect was measured as a state and, according to the HMIEM, a situational level (Vallerand, 1997). The Positive and Negative Affect Schedule (PANAS) was used for this purpose (Watson, Clark, & Tellegen, 1988). The PANAS consists of two 10-item subscales, one measuring positive and the other negative affect. Using a five-point Likert scale, participants were asked to rate themselves on certain adjectives, representing how they felt, retrospectively, during their last competitive performance in their specific sport. The positive affect scale included words such as 'excited', 'enthusiastic' and 'inspired'. The negative affect scale used words such as 'distressed', 'hostile' and 'irritable'. The internal consistencies of both the positive and negative scales have been shown by Watson et al. (1988) at a number of time points. These were specifically, how the individual felt 'right now', 'today', 'during the past few days', 'during the past few weeks', 'during the past year', and 'in general'. For the positive affect scale, results showed the internal consistencies at the different time points to be: right now ( $\alpha=.89$ ), today ( $\alpha=.90$ ), during the past few days ( $\alpha=.88$ ), during the past few weeks ( $\alpha=.87$ ), during the past year ( $\alpha=.86$ ), and in

general ( $\alpha=.88$ ). For the negative affect scale, internal consistencies were shown to be: right now ( $\alpha=.85$ ), today ( $\alpha=.87$ ), during the past few days ( $\alpha=.85$ ), during the past few weeks ( $\alpha=.87$ ), during the past year ( $\alpha=.84$ ), and in general ( $\alpha=.87$ ).

### **Data Analysis**

The data analysis consisted of a series of procedures allowing inferences to take place from the data set. Initially, the data set was screened for missing data. As the missing data was randomly distributed, series means were computed and used to replace any missing values. After the missing data was replaced, the assumptions of regression analysis were assessed. These included an analysis of normal distribution, covariance between any study variables and multivariate outliers. Subsequently, internal consistencies of the subscales within the questionnaires were assessed, by calculating Cronbach alpha coefficients. Next descriptive statistics were computed, including mean values, ranges and standard deviations. Correlations were then calculated to assess the relationships between the study variables. Specifically, correlation coefficients were calculated for the relationship between motivation types and coping strategies, coping strategies and affective outcomes, and finally between motivation and affective outcomes. Finally, multiple linear regressions were carried out in order to test the hypotheses. In order to address the initial purpose of the investigation, to assess the relationship between motivation and outcomes of motivation, four regression equations were carried out. Specifically to assess the relationship between motivation and coping, two regressions were carried out. These regressions assessed the relationship between motivation, with the types of motivation as predictors, and each specific coping style as the dependent variables. Therefore, regressions were carried out assessing the relationship between motivation and task-

oriented coping and the relationship between motivation and disengagement-oriented coping. Next regressions were carried out with motivation as a predictor and affective outcomes as the criterion variable. Additionally, two regressions were carried out, the first with motivation as the predictor and positive affect as the criterion variable, and the second with motivation as the predictor and negative affect as the criterion variable. In order to test the secondary purpose of this investigation, to assess the relationship between the outcomes of motivation, two regressions were carried out to specifically test the relationship between coping and affect, to see if the manner in which athletes coped with stress during their sporting performance related to the enjoyment they felt whilst performing. The first regression assessed this relationship with coping as the predictor variable and positive affect as the criterion variable, and the second regression assessed coping as the predictor variable and negative affect as the criterion variable.

## Chapter 3 – Results

### Demographics

After removal of data that violated assumptions, the study data set consisted of 145 university athletes competing in the OUA or CIS (See missing data section below for explanation). The sample included 62 (42.8%) men and 83 women (57.2%). In terms of the sports the athletes participated in, 18 played volleyball (12.4%), 22 basketball (15.2%), 68 rowed (46.9%), 20 rugby (13.8%), 1 squash (0.7%), 5 soccer (3.4%), 2 ran cross country (1.4%), 2 wrestled (1.4%), 5 lacrosse (3.4%), 1 swimming (0.7%) and 1 baseball (0.7%). The mean age of the athletes in the sample was 20.01 ( $SD=1.59$ ) years, and on average they had been competing in their sport for 6.90 ( $SD=4.23$ ) years. The athletes in the sample on average spent 17.00 ( $SD=10.40$ ) hours a week training for their sport, and on average had last competed in their sport 8.92 ( $SD=11.23$ ) weeks ago. In terms of the highest level that athletes had participated at, 2 (1.4%) said their highest level was club level, 4 rep (2.8%), 101 university (69.7%), 18 provincial (12.4%) and 20 national (13.8%). Eighty-two (63.6%) of the athletes in the sample were starters and 47 were non-starters (36.4%). Finally, in terms of eligibility, 47 (34.6%) athletes were in their first year of eligibility, 24 (17.6%) their second, 35 (25.7%) their third, 21 (15.4%) their fourth and 9 (6.6%) their fifth. The final sample consisted of 132 (91%) Brock University athletes and 13 (9%) Queens University athletes

### Missing Data

Initially the study sample consisted of 148 current OUA/CIS athletes who returned questionnaires. On inspection of these returned questionnaire packages, two



participants' were removed from the sample that was included in the further analysis, as entire questionnaires were missing from the returned questionnaire booklet, therefore making the participant's other information inappropriate to use in further analysis. In total, after removing the two participants with whole questionnaires missing, a total of 36 missing data points were found. This accounted for 0.30% of the total data set.

Visual inspection of the distribution of the additional missing data showed that the missing data within the sample were randomly distributed. As this was the case, missing values were replaced using series mean values calculated from the entire sample, using the statistical analysis program SPSS. These series means values were therefore included in the subsequent analysis, in place of the missing data.

### **Multivariate Outliers**

Mahalanobis distance was assessed at a factorial level to assess for any multivariate outliers. It was determined that, at a factorial level, no multivariate outliers were present in the data set so no further eliminations were required to be made from the data set.

### **Multicollinearity**

Pearson bivariate correlations were computed, to assess for any multicollinearity across the factors (See Table 2). Factors that were highly correlated would be considered redundant. An  $r \geq .90$  between two variables would be considered as collinear (Tabachnick & Fidell, 2007). However, correlational data showed that no values exceeded the cut off point, and all values were deemed to fall within the assumption of a lack of multicollinearity (See Table 2).

### **Exploratory Factor Analysis – CICS**

A principal components analysis with oblimin rotation was carried out on the 10 factor structure of the CICS. Due to the fact that Amiot, et al. (2004) found a two-factor model in their exploratory factor analysis, using a very similar mixed sample of athletes, the factor analysis in the current investigation was forced into a two-factor solution. This 2 factor solution accounted for 48.44% of the variance. Factor loading in the first factor ranged from 0.52-0.75, and 0.70-0.74 in the second factor (see Table 4). As per the suggestions of Tabachnick and Fidell (2008), factor loadings of greater than .45 were interpreted. The first factor consisted of thought control, mental imagery, relaxation, effort expenditure, logical analysis, and seeking support. This factor consisted of the adaptive, task-oriented coping strategies, and was therefore termed task-oriented coping (Amiot, et al., 2004; Amiot, Blanchard, & Guderan, 2007; Skinner, 2003). The second factor consisted of social withdrawal, mental distraction, and disengagement/resignation. This factor contained the disengagement-oriented types of coping as suggested by theoretical taxonomies of coping, and previous research, and was termed disengagement-oriented coping (Amiot, et al., 2004; Amiot, Blanchard, & Guderan, 2007; Skinner, 2003). Venting of unpleasant emotions was not included in the model, as it loaded onto the second factor but had a loading value of 0.44, which is considered inadequate to include in, and represent a specific factor (Tabachnick & Fidell, 2008).

### **Estimates of Scale Reliability**

Internal consistencies (See Table 1) were assessed for the factor subscales within the questionnaires (Cronbach, 1951). Cronbach Alpha ( $\alpha$ ) scores were

computed using SPSS, and ranged from .80 for disengagement-oriented coping to .95 for the motivation variable of amotivation (See table 1).

### **Descriptive statistics**

Descriptive statistics were calculated for all BRSQ, CICS and PANAS variables within the study sample (See Table 1). Results showed that athletes in the sample reported higher levels of self determined subscales than non-self determined subscales. Specifically when assessing the BRSQ subscales, the participants showed the highest levels of the most self determined subscale, Intrinsic Motivation (See Table 1). The next most prevalent subscale in the sample was the second most self determined form of extrinsic motivation, Identified Regulation. This was followed by the most self determined form of extrinsic motivation, Integrated Regulation. The three least reported forms of motivation in the sample were the 3 kinds of non-self determined motivation; Introjected Regulation, External Regulation and Amotivation (See Table 1). In terms of coping, athletes in the sample reported higher scores on the task-oriented coping subscale than disengagement-oriented coping subscale (See Table 1). Finally, results of the PANAS showed that athletes in the sample had higher scores on the Positive Affect subscale, than the negative affect subscale (See Table 1).

### **Multivariate correlations**

Multivariate correlation analysis was carried out to assess the relationships across the factors of the specific variables, and within the specific measures (See Table 2)

## **Multiple Regression Analysis**

A series of multiple linear regressions were carried out to assess predictions within the data set. Specifically six multiple regressions were carried out: two to assess the ability of motivation to predict coping, two to assess the ability of motivation to predict affective outcomes of competitive sport participation, and finally two to assess the ability of coping to predict affective outcomes of competitive sport participation. According to the recommendations of Tabachnick and Fidell (2007), the sample size was adequate for carrying out regression analysis. Using the equation  $50+8m$ , where  $m$  is the number of independent variables, the estimated minimum sample size required to carry out the regressions in the investigation would be 98 which is below the final sample size of 145 (Tabachnick & Fidell, 2007). The equation was used a priori to establish the minimum sample size, which was used as a guide when collecting data to ensure the minimum sample size required for the analyses was reached.

### **Athlete motivation and coping with stress.**

The first pair of multiple regressions aimed to assess the ability of the motivation variables proposed within OIT, consisting of amotivation, external regulation, introjected regulation, identified regulation, integrated regulation and intrinsic motivation, to predict coping with stress. Specifically these regression analyses aimed to assess the predictive value of the athlete's motivation to perform in their sport, in terms of predicting the coping style that they used when participating in their sport.

The first regression assessed the ability of the athlete's motivation level to predict task-oriented coping (See Table 3.1). Results showed that the motivation

variables significantly predicted 14.3% of the variance in the athletes level of task-oriented coping during their sporting event ( $R^2_{adj}=0.14$ ,  $F(6,138)=5.01$ ,  $p<0.001$ ). Specifically, identified regulation ( $\beta=0.23$ ,  $p<0.05$ ) and integrated regulation ( $\beta=0.23$ ,  $p<0.05$ ) were both significantly associated with greater use of task-oriented coping in the sample.

The next regression aimed to assess the ability of athlete's motivation to predict disengagement-oriented coping (see Table 3.2). Results showed that the motivation variables significantly predicted 29% of the variance in the athlete's level of disengagement-oriented coping employed during their sport ( $R^2_{adj}=0.29$ ,  $F(6,138)=10.58$ ,  $p<0.001$ ). Through inspection of the beta coefficients, the significant predictors within the motivation variables were amotivation ( $\beta=0.34$ ,  $p<0.001$ ) and external regulation ( $\beta=0.34$ ,  $p<0.01$ ) which both positively predicted use of disengagement-oriented coping.

### **Athlete motivation and affective outcomes of sporting participation.**

Regressions were carried out to assess the predictive value of the motivation variables in predicting positive affect and negative affect related to sport participation. Results of the regressions showed that motivation significantly predicted positive affect, with the motivation variables accounting for 23% of the variance in athletes Positive Affective Outcomes ( $R^2_{adj}=0.23$ ,  $F(6,138)=8.15$ ,  $p<0.001$ ). Specifically, upon assessing beta coefficients, it was shown that the only motivation variable that significantly contributed to this prediction was Intrinsic Motivation which positively predicted positive affect ( $\beta=0.23$ ,  $p<0.05$ ) (see Table 3.3). Additionally, a further regression analysis showed that athlete motivation significantly predicted Negative Affect, with athlete motivation accounting for 11% of the variance in Negative Affect

( $R^2_{adj}=0.11$ ,  $F(6,138)=4.08$ ,  $p<0.001$ ), however none of the specific motivation variables were significant predictors of Negative Affect (see Table 3.4).

**Athlete coping strategies used during performance and affective outcomes to sporting participation.**

Regressions were also carried out to assess the ability of athlete coping strategies used during sporting performance to predict affective outcomes of competitive sport participation. Specifically, the coping factors of task and disengagement-oriented coping were shown to significantly predict Positive Affect, accounting for 31% of the variance in Positive Affect ( $R^2_{adj}=0.31$ ,  $F(2,142)=33.95$ ,  $p<0.001$ ). Both task-oriented and disengagement-oriented coping were significant predictors of this positive affect, with task-oriented coping positively predicting Positive Affect ( $\beta=0.47$ ,  $p<0.001$ ), and disengagement-oriented coping negatively predicting Positive Affect ( $\beta=-0.37$ ,  $p<0.001$ ) (see Table 3.5)

Additionally, the coping strategies the athlete used significantly predicted negative affective outcomes to sporting participation, and accounted for 14.2% of variance ( $R^2_{adj}=0.14$ ,  $F(2,142)=12.94$ ,  $p<0.001$ ). Specifically, disengagement-oriented coping was the sole significant predictor of negative affect, predicting an increase in the variable ( $\beta=0.39$ ,  $p<0.001$ ) (see Table 3.6).

## **Chapter 4 - Discussion**

Athlete motivation and the strategies athletes use to cope with stress have long been shown to be vital in predicting a number of outcomes of sporting performance. Importantly, both of these concepts have been linked to the affective outcomes experienced by athletes during their sporting performance (Crocker & Graham, 1995; Vlachopoulos, Karageorghis, & Terry, 2000). This relationship is vital to continued athlete participation as affective outcomes to sporting performance have been shown to play a major role in continued sporting participation (McAuley et al., 2003).

Theoretical backing is also in place for the relationship between athlete motivation and affective outcomes, as well as athletes' use of coping strategies and affective outcomes. Self Determination Theory (SDT) was proposed to assess individuals' motivation toward their specific behaviours. The theory states that motivation sits on a continuum, ranging from less self determined, or controlled motivation, to more self determined, or autonomous motivation. SDT states that the satisfaction of certain environmental mediators can help create more autonomous motivation, and in turn numerous positive outcomes (Ryan & Deci, 2002). Stemming from SDT, Vallerand proposed his Hierarchical Model of Intrinsic and Extrinsic Motivation (HMIEM) (Vallerand, 1997). An important premise of the HMIEM is that it proposes that motivation, on a global, contextual and situational level predicts our cognitive, affective and behavioural outcomes to our behaviour (Vallerand, 1997).

The relationship between coping and affective outcomes has also received theoretical attention. Specifically, Lazarus (1999) has made this link by proposing his Cognitive Motivational Relational Theory (CMRT). CMRT states that the relationship between stress, coping with stress and emotional or affective responses, is a highly

linked dynamic process. To summarise briefly, when faced with a stressful situation, we appraise the best way available to us to cope with this stress, and the selection of the coping strategy that we carry out is vital in determining our emotional responses to the stressful situation (Lazarus, 1999).

Despite the importance of motivation and coping with stress in determining numerous factors, including affective outcomes to sport, and that fact Lazarus has stated that any assessment of coping strategies should take into account the motivation that lead to them being selected, there is currently little research assessing the relationship between motivation and coping with stress within a sporting environment (Lazarus, 1991). Additionally, none of this research has examined motivation using each level of motivation proposed by OIT. It was therefore the primary aim of the investigation to assess the effects of athlete motivation on specific motivational outcomes, using each level of motivation, as proposed by OIT. Specifically how athletes chose to cope with stress during their sporting participation, and their affective outcomes of sporting participation was investigated. The secondary aim of the investigation was to assess how the athlete coped with stress during their performance can influence affective outcomes of their sporting participation.

### **The between Athlete Motivation and Athlete Coping Strategies**

As stated, the primary aim of the investigation was to assess the relationship between the type of motivation the athletes in the sample had to perform in their specific sport, and how they coped with stress whilst they performed in their sport. It was hypothesised that more self determined forms of motivation; specifically intrinsic motivation, integrated regulation and identified regulation, would significantly predict the use of increased task-oriented coping strategies in our sample. The results



provided partial support for these hypotheses. Together, as a model, the motivation variables significantly predicted task-oriented coping. Specifically, the self determined forms of extrinsic motivation: integrated regulation and identified regulation, were shown to predict increased levels of task-oriented coping amongst the athletes. However, intrinsic motivation was not shown to be a significant predictor. Additionally, it was hypothesised that amotivation, an absence of motivation, and non-self determined forms of motivation would significantly predict increased use of disengagement-oriented coping strategies. Again, partial support was found for this hypothesis. Together, as a model, the motivation variables significantly predicted disengagement-oriented coping. Specifically, amotivation and external regulation significantly predicted use of disengagement-oriented coping strategies, but introjected regulation did not.

These findings, fall in line with the limited amount of past research that has assessed the relationship between motivation to partake in a particular behaviour and the way we cope with stress whilst carrying out this behaviour. In general, research has shown self determined motivation to be linked to task-oriented coping. Specifically, Amiot et al. (2004) found that self determined motivation positively predicted task-oriented coping in a sample of athletes. Additionally, Perreault and Vallerand (2007) found, in a sample of wheelchair basketball players, that more self determined motivation positively predicted coping skill, with coping skill being defined as the use of adaptive, task-oriented coping strategies. Additionally, outside of the athletic environment, self determined motivation has been linked to adaptive, relationship saving coping strategies, in romantic relationships (Knee et al., 2002). As previously stated, in the current investigation, two of the three self determined motivation variables, specifically identified regulation and integrated regulation,

significantly predicted use of task-oriented coping. Therefore, as with the past research, types of self determined motivation were shown to predict task-oriented coping use. However, surprisingly and in contrast to this past research, intrinsic motivation was not shown to predict use of task-oriented coping. This is a surprising finding as intrinsic motivation is the most self determined form of motivation that an individual can have to carry out their specific behaviour, and in the past self determined motives have been shown to predict task-oriented coping (Amiot et al., 2004; Knee, et al., 2002; Perreault & Vallerand, 2007; Ryan & Deci, 2002).

Past research has also shown non-self determined motivation to predict disengagement-oriented coping. Specifically, in the study by Amiot et al. (2004), it was shown that non self determined motivation predicted increased use of disengagement-oriented coping strategies. Additionally, in the study by Knee and Zuckerman (1998), using a sample of psychology students, it was shown that non self determined motivation predicted increased levels of disengagement-oriented coping strategies during exams. Finally, in the study carried out by Knee et al. (2002) using romantic relationships, it was found that increased non-self determined motivation was again linked to use of disengagement-oriented coping strategies. This past research is supported by the findings of this study to some extent. As already stated, two of the three non-self determined motivation subscales, amotivation and external regulation, significantly predicted use of disengagement-oriented coping use. However, introjected regulation did not. This finding is not altogether surprising and raises certain theoretical questions about the past research, as according to SDT, introjected regulation is the most self determined form of motivation that can still be considered non-self determined, and is therefore the level of non-self determined motivation that is theoretically least likely to be related to disengagement-oriented

coping (Ryan & Deci, 2002). It is therefore the case that although, in general, it has been shown by past research that non-self determined motivation predicts use of disengagement-oriented coping, this may have been due to the other types of non-self determined motivation, such as amotivation and external regulation and not introjected regulation. The fact that the present study assessed the ability of all the individual motivation variables, as proposed by OIT to assess the ability of motivation to predict coping, is a strength over the past research, which has, in general, looked at composites of the motivation variables, labelled non self determined, and generally consisting of a combination of amotivation, extrinsic regulation and introjected regulation, or self determined motivation, consisting of a combination of identified, integrated and intrinsic regulation (Ryan & Deci, 2002). Additionally, research that has looked at these variables individually has not looked at all of the levels and disregarded some (Ryan & Deci, 2002). This is a strength of the current investigation as it adds detail to the findings, and allows us to see the effects of all of the specific motivation subscales individually, as proposed by OIT (Ryan & Deci, 2002).

### **The Relationship between Athletes' Motivation and Affective Outcomes of Sporting Participation**

Results of the investigation showed that there were significant relationships between specific types of motivation and the affective outcomes that athletes had in their sporting performance. Specifically, in terms of self determined motivation, results showed that the motivation model in general predicted positive affect. Specifically, however, it was shown that the only motivation variable that significantly predicted positive affect was intrinsic motivation, which positively predicted positive affect. None of the other types of motivation played significant

roles in predicting positive affect. This gives partial support for one of the two hypothesised relationships regarding motivation and positive affect, as it was hypothesised that all types of self determined motivation would positively predict positive affect.

The effects of motivation on positive affect is again partially in line with past research. Specifically, past research has shown self determined motivation to be positively linked to numerous positive affective outcomes such as more positive affect (Gagne et al., 2003), increased well-being (Solberg & Halvari, 2009), increased enjoyment and reduced boredom (Alvarez et al, 2009), and positive emotions and satisfaction (Blanchard et al., 2009) in sporting environments. The finding that intrinsic motivation positively predicted positive affect is supported by past theoretical proposals within SDT as according to OIT it is the most self determined form of motivation. However, the other self determined motivation types did not predict positive affect, as would be suggested by past research (Ryan & Deci, 2002). However, again, the past research studies used composites of the motivation types and therefore it is unclear what role the specific types of self determined motivation had on the affective outcomes. Additionally, as intrinsic motivation is the most self determined form of motivation, it is theoretically suggested that the when athletes hold this level of motivation towards their sport, then their participation is a fully internalised behaviour and therefore most likely to result in positive affective outcomes (Ryan & Deci, 2002)

Additionally, results of the investigation showed that the motivation model as a whole was a significant predictor of negative affective outcomes of sporting performance. However, it was the case that none of the specific levels of motivation

proposed by OIT (Ryan & Deci, 2002) were significant predictors of negative affect. This is contrary to the hypothesised relationships as it was hypothesised that all types of non-self determined motivation would significantly predict increased negative affect.

This is contrary to past research, as it has been shown that non-self determined forms of motivation have predicted negative affective outcomes to sporting performance. Specifically, in sporting contexts, less self determined motivation has been positively related to negative affect (Gagne et al., 2003) and a reduction in all previously stated positive variables (Alvarez et al., 2009; Blanchard et al. 2009; Solberg & Halvari, 2008). It is possible that this is due to the temporal nature of the measurements made in the study. Specifically, in the current investigation, the athletes were asked what their motivation was toward why they played their sport in general, however they were asked what their affective response was to partaking in competitive performance in their specific sport. It is possible that this may have reduced any link between motivation and negative affect, as it is possible that athletes are motivated differently and enjoy some aspects of their sport more than others. It is therefore possible to suggest that if the affective outcomes to training for their sport had been assessed there would have been a much stronger relationship shown. This explanation is also given support by the HMIEM, which states that the relationship between motivation and affective outcomes takes place at specific level of generality, proposing that the relationship takes place at a global, contextual and situational level (Vallerand, 1997). In the current investigation, motivation was measured at the more general contextual level, of the athletes sport in general, and affect were measured at the situational level, of the athletes last sporting performance. Therefore the assessed

relationship between the two variables in the investigation was across the levels of generality, possibly explaining the lack of a relationship (Vallerand, 1997).

Additionally the findings of the investigation are partially related to previous theory. Specifically, the finding that the construct of motivation as a whole predicted both positive and negative affect is in line with the proposed relationships within the HMIEM (Vallerand, 1997). This is the case as the HMIEM states that motivation is linked to affective outcomes. However, partial support is only given as not all of the specific types of motivation played a part in predicting the affective outcomes of the athletes.

### **The Relationship between the Coping Strategies Athletes use During Sporting Performance and the Affective Outcomes to that Performance**

Results of the investigation showed that, in the sample of athletes, coping strategies predicted positive affective outcomes in the athletes. Specifically, task-oriented coping strategies significantly predicted increased positive affect, whereas disengagement-oriented coping strategies significantly predicted decreased positive affect. This is in line with the previously stated hypothesised relationship.

Results of the relationship between coping and negative affect showed that coping significantly predicted negative affect in the sample of athletes. Specifically, disengagement-oriented coping predicted an increase in negative affect. This was consistent with the hypothesised relationship between disengagement-oriented coping and negative affect. However, it was also hypothesised that task-oriented coping would predict decreased negative affect. This was not the case in the results of the investigation.

Empirical support has been given for these study findings, with exception of the finding that task-oriented coping did not predict reduced negative affect (Amiot et al., 2004). It has been shown that task-oriented coping predicts increased positive affect and reduced negative affect, whereas disengagement oriented coping has been shown to predict reduced positive and increased negative affect. These results have been shown in British university athletes (Ntoumanis, Biddle, & Haddock, 1999) and a mixed demographic group of athletes (Crocker & Graham, 1995).

The study findings also fall in line with previous theory. CMRT (Lazarus, 1999) states that coping is a key component in determining emotional outcomes, and that emotion is generated throughout the appraisal and coping process and as a result of the outcome of the coping strategy (Lazarus, 2000). The relationships between athlete coping and affect in the results of the current study are in line with this theory as they show that coping is a predictor of both positive and negative affect, with task-oriented coping related to increased positive affect and disengagement-oriented coping related to increased levels of negative and reduced positive affect.

### **Significance of Findings/Practical Implications**

The results of the investigation hold certain practical significance. Specifically, these findings show that two of the three self determined forms of motivation predict athletes using more task-oriented coping strategies during their sporting performance. Additionally, the two most non-self determined forms of motivation, amotivation and external regulation, predicted increased disengagement-oriented coping. These findings are supported by previous research which has also found these relationships amongst athletes (Amiot et al. 2004; Perreault & Vallerand, 2007). However, the current investigation expands upon this previous literature as it is

currently the only investigation to assess the effects of motivation on the way athletes cope with stress during sport, using all the specific levels of motivation put forward within the continuum of OIT, within SDT (Ryan, & Deci, 2002). Previous research has used a 2-factor model to assess motivation, terming it either self determined or non self determined (Amiot et al, 2004), or has not assessed all the proposed levels of motivation, specifically, not assessing integrated regulation (Perreault & Vallerand, 2007). Therefore the current finding adds depth to the previous literature as the study design assessed motivation according to OIT, therefore assessing it, according to how the theory was proposed, and in a more detailed fashion, as it allows the reader to see which specific motivation is having a specific effect on athlete coping use (Ryan & Deci, 2002). When composite models were used this specific detail would have been missed as the extent to which each specific level of motivation was affecting coping would not have been shown. Therefore assessing motivation using a composite in this fashion is not assessing motivation in the way it has been proposed by OIT (Ryan & Deci, 2002).

It is vital for coaches and athletes to know how motivation can have a role in predicting coping strategies. Evidence in the sport psychology literature has shown task-oriented coping to lead to a number of positive outcomes. Specifically, research has proposed that coping can have a direct influence on goal attainment, and it has been shown by numerous studies that task-oriented coping is linked to increased goal attainment, whereas disengagement-oriented coping is linked to reduced goal attainment (Amiot et al., 2004; Gaudreau & Blondin, 2002). Additionally task-oriented coping has been linked to increased positive affective outcome amongst British university athletes (Ntoumanis et al., 1999), a mixed demographic group of athletes (Crocker & Graham, 1995) and numerous other athletic samples (Gaudreau &



Blondin, 2002, 2004a). Additionally, in the current study, task-oriented coping predicted increased positive affect, whereas disengagement-oriented coping predicted reduced positive and increased negative affect.

The previously proposed relationships between the type of coping strategy used, affective outcomes and goal attainment, make the finding that athlete motivation can help predict coping with stress, a vital one to a coach wishing to get the most out of his/her players. The study findings help suggest to the coach that by manipulating the athletes' motivation and ensuring that it is self determined, a positive influence can possibly be made as to how the athlete copes with stress. This, in conjunction with the benefits of more self determined motivation (e.g affective; Blanchard et al., 2009), can have a major positive influence on numerous sporting outcomes, and specifically, as shown in the present study, positive affect (e.g. Crocker & Graham, 1995).

Past research has shown how a coach has the ability to determine their athletes motivation. It has been suggested by the Coach-Athlete Motivation Model that if a coach ensures that he/she is autonomy supportive, involved with the athletes, and gives clear structure to his/her coaching in the sporting environment then more self determined forms of motivation will take place (Mageau & Vallerand, 2003). This relationship is a result of a proposed direct link between autonomy support, structure and involvement, in predicting the satisfaction of the basic psychological need for autonomy, competence and relatedness proposed within the Basic Needs Theory of SDT (Maguea, & Vallerand, 2003; Ryan & Deci, 2002). The satisfaction of the basic needs will then in turn, according to SDT, predict our level of self determination, with satisfaction of the basic needs linked to more self determined motives (Maguea &

Vallerand, 2003; Ryan & Deci, 2002). A large amount of empirical evidence has been put in place, supporting the relationship between coach autonomy support and basic need satisfaction, specifically amongst team sports participants from the United Kingdom (Adie et al., 2008), adolescent soccer and cricket players (Reinboth, Duda, & Ntoumanis, 2004), high school and college athletes (Amarose, & Anderson-Butcher, 2007), and male soccer players (Alvarez et al., 2009). In addition to these findings, it has also been shown that perceived coach autonomy support predicts self determined motivation, without assessing basic need satisfaction, in a sample of competitive swimmers (Pelletier, Fortier, Vallerand, & Briere, 2002). Less evidence is in place supporting the importance of perceived coaching structure and involvement in predicting basic need satisfaction of the athletes, although preliminary evidence is in place. Specifically, Gregson and Wilson (2008) found athlete perceptions of coach autonomy support, structure and involvement to all be related to the satisfaction of the athletes' satisfaction of the needs of autonomy, competence and relatedness.

Therefore past research shows that it is in the coach's ability to manipulate athlete motivation, through his/her behaviour. As the results of the current investigation show, in conjunction with past research, links between motivation and coping have been shown (Amiot et al., 2004; Knee, & Zuckerman, 1998; Knee et al., 2002; Pereault, & Vallerand, 2007). This tentatively suggests that the coach may have the ability to influence athlete coping through the manipulation of athlete motivation. However further research would be required to give empirical evidence to this statement. This is vital as athlete self determined motivation during sport has been shown to have major positive influence on both affective outcomes as shown in the present study and past research (e.g. Gagne et al., 2003), athletic performance (Gillet, Vallerand, Amoura, & Baldes, 2010) and goal attainment (Amiot et al., 2004).

The finding that both specific motivation and coping styles were linked to both increased positive and reduced negative affect in the present study also holds practical significance. Results suggest that through ensuring that athletes are self determined in their motivation and coping with stress in a task-oriented manner, the athletes will be able to experience positive affective outcomes to their sporting performance. Additionally to the increased enjoyment level, increased positive affect has been shown in previous research to be linked to prolonged participation in sport (Mcauley et al., 2003)

Despite the significance found and the possible practical significance of these findings, conclusions drawn about the relationship between motivation and coping should be seen as exploratory and therefore treated with caution. This is the case as the relationship between motivation and coping is complex, and it has been suggested that the majority of the relationships proposed within the integrated model, aiming to combine SDT and CMRT, are related in a reciprocal fashion (Ntoumanis et al., 2009). Additionally the model states that motivation does not directly affect coping and the relationship is mediated by appraisal of the environmental demand that is causing the stressful situation (Ntoumanis et al., 2009). This is stated to be the case as coping responses always require an evaluation of the stressful encounter (Ntoumanis et al., 2009). As appraisal was not measured during the investigation, the extent to which it mediated the relationships shown between the motivational variables and the coping responses is not known, and therefore, as previously stated, the relationships between motivation and coping should be treated with caution.

In conjunction with this, conclusions drawn about the temporal nature of the relationship between motivation and coping should also be approached cautiously.

The relationship assessed in the investigation is in terms of how motivation can predict coping with stress. However it has been theoretically suggested that this may be a reciprocal relationship, to some extent (Ntoumanis et al., 2009). Specifically, the integrated model put forward by Ntoumanis et al. (2009) suggests that the outcomes of coping and the coping strategies selected can have a major role in determining our psychological need satisfaction, which in turn will predict our level of self determined motivation (Ntoumanis et al., 2009) However the presence of this possible reciprocal relationship was not measured in the investigation it cannot be assumed that motivation is simply predicting coping without coping possible having an effect on the motivation. Therefore, as stated, caution should be used when interpreting the temporal nature of the results

Additional caution should also be used when drawing conclusions about the relationship between motivation and coping with stress in the current investigation, due to the fact that numerous factors, not controlled for in the investigation, have been shown to play a major role in determining athlete coping. Specifically, research has shown that coping with stress can be influenced by but not limited to: athlete goal orientation (Ntoumanis, & Biddle, 1998), attributions (Sellers & Peterson, 1993), level of competitive trait anxiety (Giacobbi & Weinberg, 2000), self esteem (Lane, Jones, & Stevens, 2002) and trait self confidence (Hardy, Jones, & Gould, 1996). As none of these variables were controlled for, the extent of their influence in affecting coping strategies and possibly having a mediational role in the motivation and coping relationship is not know, and therefore conclusions drawn about the relationship between motivation and coping should be treated with caution.

## **Limitations**

As is the case with any investigation, certain limitations existed within the design. Specifically, in this case, these centred around the study design, the way individuals were recruited, the way the data was measured and the way the data was analysed.

The initial, most apparent, limitation of the investigation is the retrospective nature of the data collection methods. In the investigation, data was collected pertaining to athletes coping strategies used during, and affective outcomes of, their last competitive performance, and their motivation toward participating in their sport. However, as the majority of the data was collected in the winter, most of the athletes assessed were out of season and had not competitively competed in their sport since the fall. This therefore required them to think back to their last sporting performance. The vast majority of research assessing coping strategies used by athletes has been retrospective (Nicholls & Pollman, 2007). For example, studies have asked athletes to recall how they coped with stress in a recent important situation (e.g, Ntoumanis & Biddle, 1998), with a study by Gould and colleagues (1993) assessing ice skaters' coping strategies that were used during an event that occurred six months previously. On average the athletes in the current study had last participated in their sport 8.92 weeks ago. Using a retrospective design in this fashion has been shown to lead to numerous problems in terms of recall (Nicholls & Pollman, 2007). It has been shown that through the passage of time people become less able to accurately recall the strategies they used to cope with stress during a specific event (Leffingwell & Ptacek, 1998). Retrospective bias can also play a role in the reduced accuracy of retrospective research. Specifically it has been shown that knowledge of results can play a major role in influencing retrospective recall in athletes (Brewer, Van Raalte, Linder, & Van Raalte, 1991).

An additional limitation is the level of the measurements made in the investigation. It is stated within the HMIEM that motivation is related to psychological outcomes at a global, contextual and situational level (Vallerand, 1997). In the investigation, motivation is measured in terms of the athletes motivation to participate in their sport in general, and is therefore measured on a trait and contextual level. However the measurements made of coping and affect were made in terms of the athlete coping strategies used in, and their affective outcomes during their last competitive sporting event. Therefore these measurements were made at a state and situational level. This difference between the state level of measurement of the affect and coping, and the trait level of the measurement of the motivation leads to a possible limitation as it goes beyond the proposed relationship of the HMIEM, as the relationship, in the investigation, is assessed between a variable at a contextual level and variables at a situational level. The HMIEM does not propose this as relationships are proposed at specific levels of generality (Vallerand, 1997). The HMIEM therefore suggests that relationships, theoretically may not be in place between these variables, and this may therefore had an effect of the results of the investigation. In future investigations it would be prudent to strictly follow the proposed relationships of the HMIEM and measure variables using the same level of generality (Vallerand, 1997).

A further limitation of the investigation is that it was cross sectional in nature. This was the case as data was collected at one time point. It is therefore not possible to infer causality in terms of the temporal nature of the relationships between variables (Amiot & Anderson-Butcher, 2007; Perreault & Vallerand, 2007). This is in conjunction with many other factors, such as lack of controls, that are associated with non experimental research designs ensures that causality in the results cannot be inferred. Due to this, it is inappropriate to suggest a sequence of events in terms of

how certain variables affected the outcome of other variables (Amiot & Anderson-Butcher, 2007).

The sample used is also a limitation of the study. In the sample, only OUA and CIS athletes were used with the majority coming from Brock University, and a small number from Queens University. Although the findings came from a wide variety of sports, the lack of variability in the demographic of the athletes, specifically that they were all university athletes, reduces possible generalisations that can be made from the results. Therefore, any findings within the results of the study should be applied with caution when being applied to any athlete population outside of the university environment in Southwestern Ontario. It has been suggested in order to be able to generalise proposed relationships between motivation and coping with stress in sport, that further research is carried out assessing the influence of age, expertise and developmental stage (Amiot et al., 2004).

A further limitation within the study was the factor structure of the coping questionnaire, CICS (Gaudreau & Blondin, 2002). When the questionnaire was designed, it was designed to have a 10 factor structure, incorporating 10 different types of coping strategies. Evidence has been shown for adequate levels of convergent, concurrent and differential validity, as well as acceptable internal consistencies, using this 10 factor model (Gaudreau & Blondin, 2002). When the measure was developed it was suggested that the 10 factors might be able to be further categorised into two second order coping strategy factors, labelled task-oriented and emotion-oriented coping, although this was not directly tested (Gaudreau & Blondin, 2002). However, they did suggest that through assessing the inter-scales correlation matrix, indirect evidence was shown for a two factor structure, including a

task-oriented coping strategies factor, and a distraction and disengagement-oriented coping strategy factor (Gaudreau & Blondin, 2002). As the use of a 10 factor model would lack parsimony, an exploratory factor analysis was carried out using the 10 factor model. The factor analysis resulted in a two factor structure within the results, and this was used in the investigation. However, there is no previous evidence that supports this specific arrangement of the two factor structure, therefore calling into question the validity of the use of the two factor structure, that was used in the investigation. Past research has also attempted to use exploratory factor analysis to create second order coping factors using the CICS, but have come up with different structures than the one yielded by the results of the present study. Specifically, a previously mentioned study, that also aimed to assess the relationship between athlete motivation and coping, amongst other variables, carried out an exploratory factor analysis to create parsimony amongst the CICS factors (Amiot et al., 2004). They found evidence for a two factor model, which although similar, included slightly different variables to the ones used in the current investigation, giving partial support for the model used in the current investigation (Amiot et al., 2004). Additionally, a further study was carried out in order to assess the factor structure of the CICS using a sample of New York Marathon runners (Gaudreau, Ali, & Marivain, 2005). They found, again through the use of confirmatory factor analysis, partial support for a three factor model, with the factors labelled task, distraction and disengagement-oriented coping. The task-oriented factor was identical to the factor labelled task-oriented coping in the current investigation, whereas the distraction-oriented coping factor in the present study contained 3 of the 4 items included in distraction and disengagement-oriented coping (Gaudreau, Ali, & Marivain, 2005).



Despite no direct evidence from previous research for the factor structure used in the current investigation, similar factor structures have been shown in the past (Amiot et al., 2004; Gaudreau et al., 2005). The factor structure used in the investigation may lack direct evidence, but according to the factor loadings, in the exploratory factor analysis, the factor structure accurately represents the trends the results of the current investigation. In the investigation, internal consistencies for the two factors were shown to be adequate, giving some support to the use of this two factor structure.

An additional limitation to the present study is the way some of the participants were recruited. Emails were sent to the coaches of all the athletic teams at Brock University, and upon receiving permission, athletes were emailed with an online questionnaire. However, only a small percentage of the athletes emailed, actually completed the study. Therefore, in order to increase numbers, participants were recruited from undergraduate classes at Brock University, in which there was a compulsory research participation component. This may have forced some of the participants to participate in the study, as they had to, to receive a grade in their class. It has been suggested that coercing participants to perform in research studies as a required component of a psychology course can have an influence on results (Cox & Spirelle, 1971). Specifically, a study was carried out by Cox and Spirelle (1971) in which the status of their subjects, in terms of whether they volunteered their time or partook as part of a research component of an undergraduate course termed 'Psychology 1', was the key contributing factor to the results of the investigation. Specifically, the study aimed to show the effects of verbal reinforcements in the operant conditioning of heart rates, and it was shown that there was a significant

affect of verbal reinforcement amongst volunteers but not the psychology students (Cox & Spirelle, 1971).

However, it was not the case in the current investigation that the participants were fully coerced to participate in the study. There were many other research studies that they could have participated in that were available to them, and they were made aware of this fact. They therefore did not have to participate in the study if they did not want to, so full coercion did not take place.

A final limitation of the investigation is the lack of any assessment of the effects or relationships of any of the demographics variables with any of the study variables: motivation, coping and affect. Therefore there may have been a vital relationship missed between one of the demographic variables and a study variable. Specifically any significance in the results may have been accounted for by the demographic variables, and therefore significance may only be the case due to the relationship between the demographic and the study variables. Additionally, covariance may have taken place between some demographic and study variables, and again this would have been missed, due to a lack of assessment.

### **Future Directions**

Despite its limitations, this study does suggest possible directions for future research. As previously stated, a limitation of this study and the majority of the coping research is that coping was assessed retrospectively which has been shown to lead to a numerous problems, including reduced accuracy of results (Nicholls & Pollman, 2007). To date no research has aimed to assess the relationship between motivation and coping using anything but a retrospective design. Specific methods have been proposed and tested to assess coping with a greatly reduced recall period or through a

prospective assessment (Nicholls & Pollman, 2007). These include daily coping measurements (Stone & Neale, 1984), diary methods (Nicholls, Holt, Pollman, & James, 2005), ecological momentary assessment (Stone et al. 1998) and think aloud techniques (Nicholls, Holt, & Pollman, 2005). Future research assessing the variables in the current investigation, using techniques such as the previously stated methods could lead to a reduction in the time between the occurrence of the coping and the measurement of it, reducing memory error and recall bias. However, techniques such as these can be problematic as they can take away from the athlete concentrating on his/her performance, and it has been suggested that this type of measurement should only be made if it does not interfere with an athlete's pre-competition, in-competition and post-competition routines (Amiot et al., 2004).

As the design of the study was cross sectional, an important future direction to take would be to assess the relationship between athlete motivation and coping longitudinally. This would therefore make it possible to see how these variables varied across a sporting season, adding depth to the findings of the current investigation. There is also currently a lack of research assessing how athlete motivation and coping may differ throughout the season. A longitudinal design could have allowed for assessment of this and would have allowed the variation that took place during the differing stages of an athlete's season to be shown.

A further future direction to take would be to look at the relationship between coping and motivation across the different aspects of an athlete's sporting experience. Specifically, as the relationship has also been assessed in relation to sporting performance, a similar study could be carried out assessing the relationship between motivation to participate and the coping strategies used in a practice environment. It is

possible that the athletes are motivated differently towards practice than they are to matches, and this line of research could therefore lead to some crucial findings.

It is also important that future studies assess the relationship between motivation and coping in a sporting domain that is different from simply university athletes. The university sporting environment is a very specific one, reducing the possible generalisation of the results. Therefore, similar studies could be carried out with different populations, to increase the application of our knowledge. For example amateur adult athletes, professional athletes and recreational athletes could be assessed. This will give us a wider knowledge of how motivation affects our coping with stress in a sporting environment.

A final future direction would be to add an assessment of athlete goal attainment to the investigation. It was initially stated by Crocker and Graham (1995) that the relationship between coping and affective states should be examined more closely to determine whether the proposed relationship between the two could be explained by other variables. It has been previously shown that the relationship between coping and affective outcomes to sporting performance is mediated by the discrepancy between our goals and our performance (Gaudreau, Blondin, & Lapierre, 2002), and by our goal attainment (Amiot et al., 2004). This research therefore states that coping may play a role in our affective outcomes to sport, but only because it can help or hinder our ability to achieve our goals (Amiot et al, 2004; Gaudreau et al., 2002). As goal achievement was not assessed in the current study, it cannot be determined whether goal achievement was the reason for the relationship between coping and affective outcomes. Despite the study by Amiot et al (2004) assessing the relationship between motivation, coping, goal attainment and affect, further

assessment of this relationship using the individual levels of motivation, as suggested by OIT, is required (Ryan & Deci, 2002).

## **Conclusions**

The findings of the current investigation are vital in furthering our knowledge of the effect of motivation on coping with stress, as well as giving further evidence for the ability of motivation and coping to predict our affective outcomes, in sporting performance.

Specifically, self determined types of motivation were shown to predict task-oriented coping. These types of motivation were identified regulation and integrated regulation. Additionally, specific types of non-self determined motivation, amotivation and external regulation, were shown to predict use of disengagement-oriented coping strategies. Relationships were also shown between athlete motivation and the affect that they experience during their performance. Specifically, intrinsic motivation predicted positive affect. Finally, coping with stress also played a vital role in the affect the athletes experienced during their performance. Specifically it was shown that task-oriented coping predicted increased positive affect whereas increased disengagement-oriented coping predicted decreased positive affect. Finally it was show that disengagement oriented coping significantly predicted increased negative affect.

These findings increase our understanding as to how motivational antecedents can have a role in determining certain behaviours that take place during our sporting performances, specifically in this case, coping with stress. They also add to our existing knowledge of the factors that lead to us enjoying our sporting performance, which is vital to continued sporting participation.

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Table 1

*Descriptive Statistics: Athlete Motivation, Coping and Affective Outcomes*

Subscale	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	$\alpha$
Amotivation	2.03	1.34	1.39	1.38	.95
External Regulation	2.74	1.55	0.49	-0.98	.93
Introjected Regulation	3.80	1.72	-0.04	-0.88	.88
Identified Regulation	6.12	0.84	-1.18	1.86	.81
Integrated Regulation	5.63	1.18	-0.80	0.30	.86
Intrinsic Motivation	6.25	0.86	-1.10	0.67	.92
Task-Oriented Coping	3.46	0.51	-0.07	.30	.84
Disengagement-Oriented Coping	1.87	0.55	0.91	.78	.80
Positive Affect	4.13	0.57	-0.80	.39	.87
Negative Affect	2.13	0.65	0.67	.20	.85

Table 2

*Bivariate Correlation Scores for Relationships between Motivation, Coping, and Affective Outcome Variables.*

Subscale	1	2	3	4	5	6	7	8	9	10
1. Amotivation	-									
2. External Regulation	.57**	-								
3. Introjected Regulation	.48**	.69**	-							
4. Identified Regulation	-.32**	-.14	-.04	-						
5. Integrated Regulation	-.23**	-.05	.05	.60**	-					
6. Intrinsic Motivation	-.54**	-.32**	-.22**	.52**	.50**	-				
7. Task-Oriented Coping	-.09	.05	.10	.36**	.37**	.21*	-			
8. Disengagement-Oriented Coping	.51**	.45**	.27**	.19*	-.14	-.35**	.10	-		
9. Positive Affect	-.35**	-.15	-.09	.40**	.34**	.45**	.43**	-.32**	-	
10. Negative Affect	.33**	.35**	.18*	-.22**	-.19*	-.33**	-.01	.39**	-.13	-

\*\*p<0.01, \*p<0.05

Table 3

*Regression Analysis: Motivation in Predicting Task-Oriented Coping*

Subscale	<i>B</i>	<i>SE B</i>	$\beta$
Amotivation	-.01	.04	-.04
External Regulation	.02	.04	.07
Introjected Regulation	.02	.03	.07
Identified Regulation	.14	.06	.23*
Integrated Regulation	.10	.04	.23*
Intrinsic Motivation	.00	.06	.00

\*\*p&lt;0.01, \*p&lt;0.05

Table 4

*Regression Analysis: Motivation in Predicting Disengagement-Oriented Coping*

Subscale	<i>B</i>	<i>SE B</i>	B
Amotivation	.14	.04	.34**
External Regulation	.12	.04	.34*
Introjected Regulation	-.05	.03	-.15
Identified Regulation	.01	.06	.01
Integrated Regulation	.00	.04	.00
Intrinsic Motivation	.06	.06	.09

\*\*p<0.01, \*p<0.05



Table 5

*Regression Analysis: Motivation in Predicting Positive Affect*

Subscale	<i>B</i>	<i>SE B</i>	B
Amotivation	-.08	.04	-.20
External Regulation	.02	.04	.05
Introjected Regulation	.01	.03	.03
Identified Regulation	.13	.06	.19
Integrated Regulation	.04	.04	.07
Intrinsic Motivation	.15	.07	.23*

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 \*\*p<0.01, \*p<0.05

Table 6

*Regression Analysis: Motivation in Predicting Negative Affect*

Subscale	<i>B</i>	<i>SE B</i>	B
Amotivation	-.08	.05	.17
External Regulation	.03	.05	.08
Introjected Regulation	.00	.04	.01
Identified Regulation	.04	.08	-.05
Integrated Regulation	.02	.06	-.04
Intrinsic Motivation	.13	.08	-.17

\*\*p<0.01, \*p<0.05

Table 7

*Regression Analysis: Coping in Predicting Positive Affect*

Subscale	<i>B</i>	<i>SE B</i>	<i>B</i>
Task-Oriented Coping	.53	.08	.47**
Disengagement-Oriented Coping	-.38	.07	-.37**

\*\*p<0.01, \*p<0.05

Table 8

*Regression Analysis: Coping in Predicting Negative Affect*

Subscale	<i>B</i>	<i>SE B</i>	<i>B</i>
Task-Oriented Coping	-.07	.10	-.05
Disengagement-Oriented Coping	.46	.09	.39**

\*\*p<0.01, \*p<0.05

Table 9

*Structure Matrix of Exploratory Factor Analysis*

CICS First Order Coping Factors	Component	
	1	2
Thought Control	.66	-.03
Mental Imagery	.73	-.07
Relaxation	.53	.43
Effort Expenditure	.52	-.42
Logical Analysis	.75	.09
Seeking Support	.63	.28
Social Withdrawal	.30	.74
Mental Distraction	-.10	.70
Disengagement/Resignation	-.16	.74
Venting of Unpleasant Emotions	.21	.44

Figure 1. Organismic Integration Theory

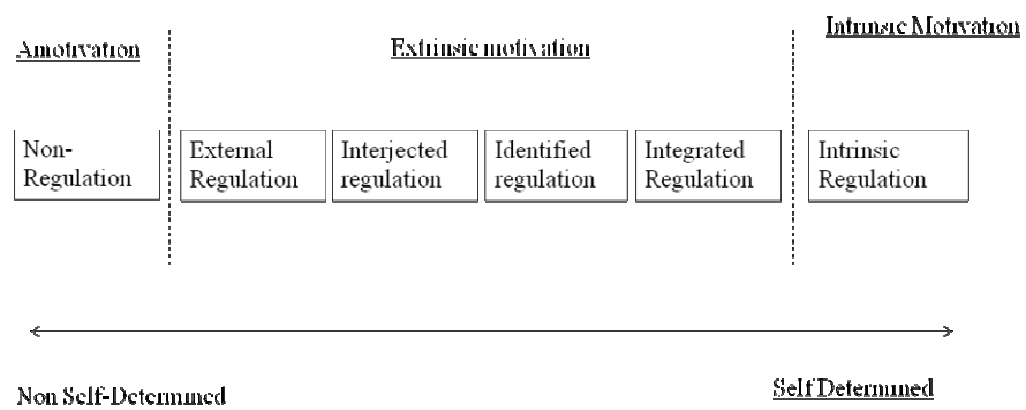


Figure 2. Hierarchical Model of Intrinsic and Extrinsic Motivation

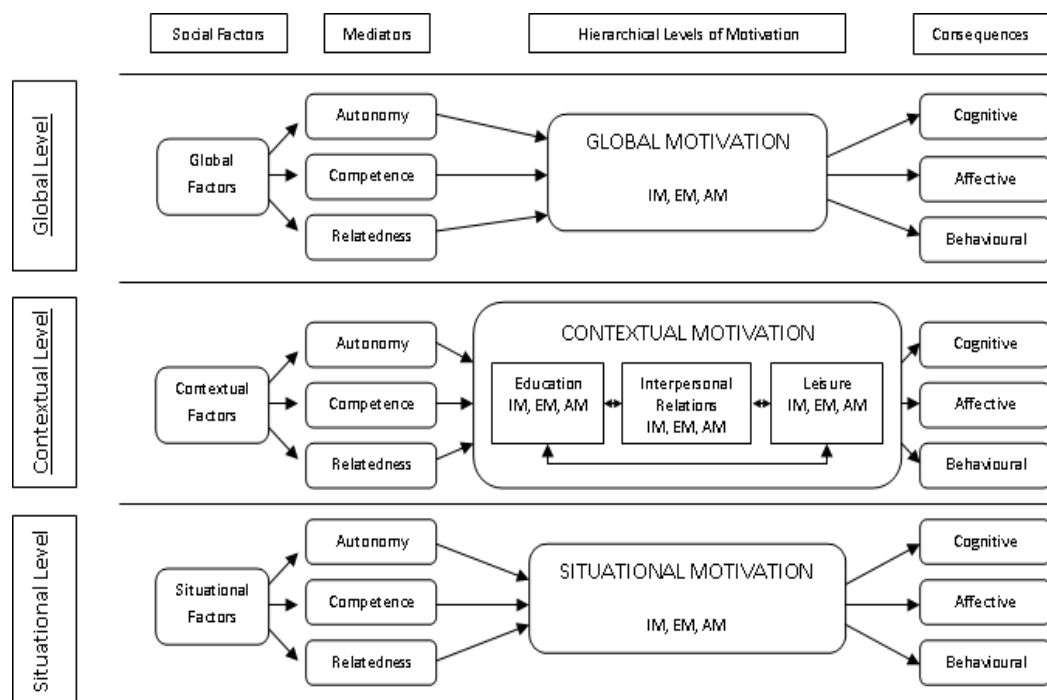


Figure 3. Cognitive Motivational Relational Theory

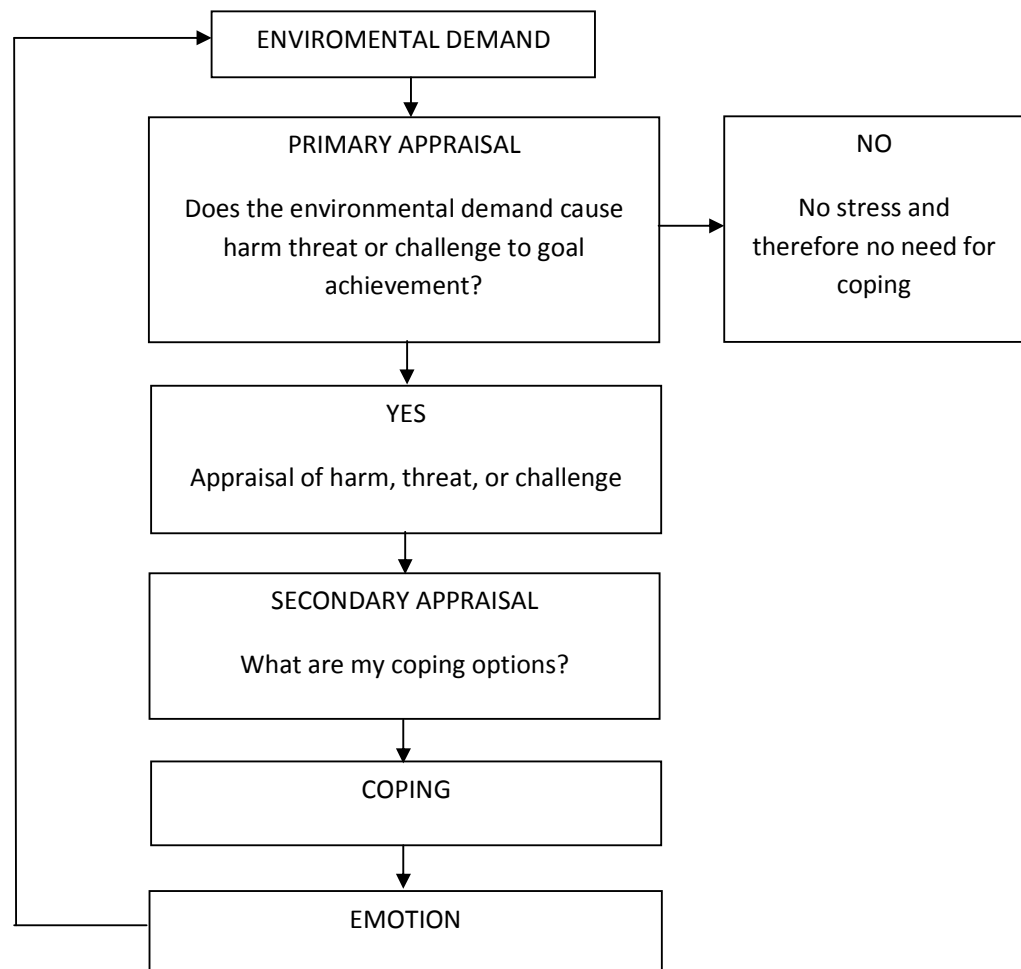
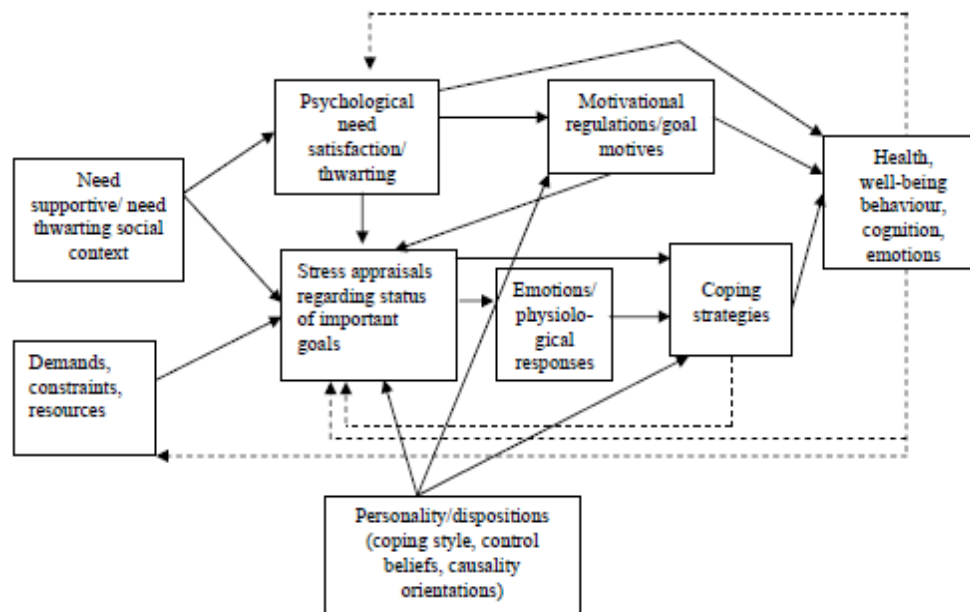




Figure 4. *Integrating Central Components of the Cognitive Motivational Relational Theory of Coping (Lazarus, 1991) and Self Determination Theory (Deci & Ryan, 1985).*



## Questionnaire 1

*Demographics*

The questions below are designed to collect demographic information of participants

What is your age?
What is your Gender?
What sport are you currently participating in?
How many years have you been participating in this sport?
What is the highest level you have played in your sport?
<input type="checkbox"/> High school <input type="checkbox"/> Club <input type="checkbox"/> Rep <input type="checkbox"/> Provincial <input type="checkbox"/> National
How many hours per week do you spend training for you sport including practice, games and weight/aerobic training?
What is Your Position on the Team?
<input type="checkbox"/> Starter <input type="checkbox"/> Non Starter
What is your year of eligibility?
How long ago did you last participate competitively in you sport?

## Questionnaire 2

*Behavioral Regulation in Sport Questionnaire*

Using the scale below identify how much each statement represents as to why you participate in your sport.

I Participate in my sport.....	Not at all true			Somewhat true			Very True
1. because I enjoy it	1	2	3	4	5	6	7
2. because I like it	1	2	3	4	5	6	7
3. because Its fun	1	2	3	4	5	6	7
4. because I find it pleasurable	1	2	3	4	5	6	7
5. because it's a part of who I am.	1	2	3	4	5	6	7
6. because its an opportunity to just be who I am.	1	2	3	4	5	6	7
7. because what I do in sport is an expression of who I am.	1	2	3	4	5	6	7
8. because it allows me to live in a way that is true to my values	1	2	3	4	5	6	7
9. because the benefits of sport are important to me.	1	2	3	4	5	6	7
10. because it teaches me self-discipline	1	2	3	4	5	6	7
11. because I value the benefits of my sport	1	2	3	4	5	6	7
12. because it is a good way to learn things which could be useful to me in my life.	1	2	3	4	5	6	7
13. because I would feel ashamed if I quit	1	2	3	4	5	6	7
14. because I would feel like a failure if I quit.	1	2	3	4	5	6	7
15. because I feel obligated to continue	1	2	3	4	5	6	7
16. because I would feel guilty if I quit	1	2	3	4	5	6	7
17. because if I don't other people will not be pleased with me	1	2	3	4	5	6	7
18. because I feel pressure from other people to play	1	2	3	4	5	6	7

19. because people push me to play	1	2	3	4	5	6	7
20. to satisfy people who want me to play	1	2	3	4	5	6	7
21. but I wonder what's the point	1	2	3	4	5	6	7
22. but I question why I continue	1	2	3	4	5	6	7
23. but the reasons why are not clear to me anymore	1	2	3	4	5	6	7
24. but I question why I am putting myself through this	1	2	3	4	5	6	7

## Questionnaire 3.

*Coping Inventory for Competitive Sport*

Each question represents things that athletes can do or think during sport. For each question you must indicate the extent to which it corresponds to what you did during your last performance in your sport.

1 Not at All	2 A Little	3 Moderately	4 Strongly	5 Very Strongly				
1. I visualised that I was in total control of the situation				1	2	3	4	5
2. I used swear words loudly or in my head in order to expel anger				1	2	3	4	5
3. I kept my distance from others				1	2	3	4	5
4. I committed myself by giving a consistent effort				1	2	3	4	5
5. I occupied my mind in order to think about other things than the Competition				1	2	3	4	5
6. I tried not to be intimidated by other athletes				1	2	3	4	5
7. I asked someone for advice concerning my mental preparation				1	2	3	4	5
8. I tried to relax my body				1	2	3	4	5
9. I analysed my last performance				1	2	3	4	5
10. I lost all hope of attaining my goal				1	2	3	4	5
11. I mentally rehearsed the execution of my movements				1	2	3	4	5
12. I got angry				1	2	3	4	5
13. I retreated to a place where it was easy to think				1	2	3	4	5
14. I gave a relentless effort				1	2	3	4	5

15. I thought about another hobby in order not to think about the Competition	1	2	3	4	5
16. I tried to get rid of my doubts by thinking positively	1	2	3	4	5
17. I asked other athletes for advice	1	2	3	4	5
18. I tried to reduce the tension in my muscles	1	2	3	4	5
19. I analysed the weaknesses of my opponents	1	2	3	4	5
20. I let myself feel hopeless and discouraged	1	2	3	4	5
21. I visualised myself doing a good performance	1	2	3	4	5
22. I expressed my discontent	1	2	3	4	5
23. I kept all people at a distance	1	2	3	4	5
24. I gave my best effort	1	2	3	4	5
25. I entertained myself in order not to think about the competition	1	2	3	4	5
26. I replaced my negative thoughts with positive ones	1	2	3	4	5
27. I talked to a trustworthy person	1	2	3	4	5
28. I did some relaxation exercises	1	2	3	4	5
29. I thought about possible solutions to manage the situation	1	2	3	4	5
30. I wished that the competition would end immediately	1	2	3	4	5
31. I visualised my all time best performance	1	2	3	4	5
32. I expressed my frustrations	1	2	3	4	5
33. I searched for calmness and quietness	1	2	3	4	5
34. I tried not to think about my mistakes	1	2	3	4	5
35. I talked to someone who was able to motivate me	1	2	3	4	5

36. I relaxed my muscles	1	2	3	4	5
37. I analysed the demands of the competition	1	2	3	4	5
38. I stopped believing in my ability to attain my goal	1	2	3	4	5
39. I thought about my family or friends to distract myself	1	2	3	4	5

## Questionnaire 4

*Positive and Negative Affect Schedule*

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to the word. Indicate the extent you felt this way during your last sporting performance. Use the following scale to record your answer.

	<u>Very slightly or not at all</u>	<u>A little</u>	<u>Moderately</u>	<u>Quite a bit</u>	<u>Extremely</u>
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5
11. Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5



15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5